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FOUNDED BY DR. MAX THOREK

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ON
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Vol. XVII FEBRUARY, 1952 No. 2

Original Articles

Surgical Management of Secondary and Absolute Glaucoma, with Special Reference to Cycloelectrolysis*

CONRAD BERENS, M.D., F.A.C.S., F.I.C.S.* AND LOUIS J. GIRARD, M.D.
NEW YORK

THIS study was undertaken in the hope of clarifying the concept of the surgical management of secondary glaucoma, with which, in some cases, even experienced surgeons find difficulty. The absence of a universally accepted classification makes it difficult to compile and analyze the results obtained by various surgeons. Of 26,000 operations for glaucoma reported in the literature, we have found only 1,512 that dealt with secondary glaucoma and were reported in sufficient detail to permit interpretation of the results (Table 1). Furthermore, the true underlying cause of secondary glaucoma, even that associated with uveitis,[1] is as imperfectly understood as that of "primary" glaucoma, which has been discussed elsewhere.[2]

*Aided by a grant from The Ophthalmological Foundation, Inc. Cases submitted by surgeons of the New York Eye and Ear Infirmary and members of the American Academy of Ophthalmology and Otolaryngology.

Read at the Sixteenth Annual Assembly of the United States Chapter, International College of Surgeons, Chicago, Sept. 12, 1951.

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In this paper the various forms of secondary glaucoma are classified and the surgical procedures to be considered in the management of each type are discussed.

Definition and Classification.—Secondary glaucoma may be defined as that form of increased intraocular pressure which is associated with some known cause.

A. TRABECULAR SECONDARY GLAUCOMA (obstruction of the trabecular spaces by mechanical means) may be classified thus:

1. *Obstruction by lens capsule* (glaucoma capsulare). This condition is usually of the noncongestive type but may become congestive. The anterior chamber is usually normal or deeper than normal, and the angle is wide or open. The procedure of choice is to extract the cataractous lens in capsule. When the tension is extremely high and cannot be lowered by miotics, it may be safer to perform a filtering operation prior to extraction, or to perform both procedures at one time,

TABLE 1.—*Results of Cyclodiathermy and Cycloelectrolysis for Rubeosis Iridis*

Procedure	No. of Eyes	Percentage Controlled†
Glaucoma Secondary to Uveitis		
Iridencleisis	95	61
Iridocorneosclerectomy	43	77
Cyclodialysis	109	48
Cyclodiathermy	306	32
Cycloelectrolysis	74	84
Trephine	102	67
Anterior sclerotomy	26	73
Hemorrhagic Glaucoma		
Iridencleisis	4	50
Iridotasis	4	100
Cyclodiathermy	209	33
Cycloelectrolysis	7	85
Trephine	1	0
Buphthalmos and Hydrophthalmos		
Iridencleisis	50	59
Iridocorneosclerectomy	1	100
Iridotasis	2	100
Cyclodialysis	6	50
Cyclodiathermy	13	56
Cycloelectrolysis	8	87
Trephine	25	34
Goniotomy	79	82
Absolute Glaucoma		
Iridencleisis	38	77
Iridocorneosclerectomy	3	67
Iridotasis	10	100
Cyclodialysis	14	51
Cyclodiathermy	196	35
Cycloelectrolysis	15	47
Sclerotomy	10	50
Trephine	67	59

*Many more operations were reported, but in many cases the results obtained were not stated clearly.

†With the exception of reports on iridocorneosclerectomy, cyclodiathermy and cycloelectrolysis, we are unable to state from the data available whether "controlled" indicated with or without miotics and what the author considered the upp er limit of normal tension.

being careful to obtain complete closure of the conjunctival wound. Extraction does not necessarily control tension. Sugar[3] stated that, of 16 eyes in which the lenses were removed, 14 had a tension of over 30 mm. of mercury (Schiotz) at least once postoperatively; 12 were controlled with miotics, and 2 required cyclodialysis.

2. *Obstruction of the trabeculae by lens matter.* This often occurs after extracapsular cataract extraction, needling or injury to the lens. An attempt should be made to wash out the lens particles, followed by repeated aspiration of the anterior chamber or paracentesis if tension is not controlled. This treatment, combined with desensitization with lens antigen and toxic staphylococcus antigen, seems to have benefited several patients. Cyclodialysis with sclerectomy may control tension if these measures fail. If all other procedures fail, cycloelectrolysis[4] should be performed.

3. *Pigmentary obstruction of the trabecular spaces.* This may possibly occur when a marked deposit of uveal pigment is presented, although changes in the trabeculae may be more important. A careful search for chronic infection in the body is indicated if pigment deposition is present.

If the cornea is clear, the Barkan goniotomy,[6] goniopuncture[7] and de Vincentiis' operation[8] are the procedures of choice. If the cornea is sufficiently opaque to prevent visualization of the angle, the angle of the anterior chamber is incised with a narrow glaucoma knife,[9] a small bridge of sclera being left. If the base tension[10] is under 30 mm. of mercury (Schiotz) and goniotomy has failed, cyclodialysis may be successful, but in the late stages iridocorneosclerectomy[11]

with complete iridectomy may be required.

4. *Blocking of the angle by downgrowth of epithelium into the anterior chamber.*—This blocking may follow intraocular surgical intervention if the corneal wound remains open too long.[12] Since further operation is useless, roentgen rays or radium[13] may be tried, as enucleation seems to be the only alternative in the presence of this serious complication.

5. *Blocking of the trabecular spaces in cases of active and inactive iridocyclitis.*—a. *Active iridocyclitis:* When there is active iridocyclitis with increased protein and cells in the aqueous, intravenous injections of typhoid H antigen, followed by aspiration of the anterior chamber[14] or paracentesis and the use of atropine, usually stabilizes tension. The introduction of 1 cc. of ethyl alcohol (30 per cent) into the region of the ciliary ganglion after the preliminary injection of 2 per cent procaine hydrochloride with epinephrine (1:1,000) is valuable if pain is severe and congestion is marked. Alcohol is not usually injected until it is known that a retrobulbar injection of procaine and epinephrine will control tension at least temporarily. It is usually desirable to lower the pressure by repeated aspiration of paracentesis until the acute process subsides, rather than adopt a more formidable procedure. When these measures fail, basal iridectomy may be successful.

Recent investigations of ACTH and cortisone have demonstrated the value of these drugs in the treatment of secondary glaucoma associated with acute active iridocyclitis.[15] In cases of secondary glaucoma associated with chronic iridocyclitis, however, the results have been disappointing.

In some cases—for example, in cases of uveitis caused by Boeck's sarcoid and in sympathetic ophthalmitis, cycloelectrolysis or cyclodiathermy may have to be performed, as in Cases 1 and 2 reported here.

CASE 1 *(Boeck's Sarcoid and Uveitis).*—P.S., a Negro aged 26, was seen by Dr. L. Benjamin Sheppard. The diagnosis was iridocyclitis with sarcoidosis (both eyes). Vision in the right eye was 20/70; in the left eye, 20/200. Tension in the right eye was 35 mm. of mercury (Schiotz), and in the left eye, 65 mm. Cycloelectrolysis was performed on the left eye. Postoperative tension in the left eye was reduced to 42 mm. of mercury (Schiotz), and cycloelectrolysis was repeated two months later. Vision in the right eye remained 20/200 and the tension was 40 mm. of mercury (Schiotz), but the patient refused additional surgical treatment. Subsequent examination revealed 20/400 vision and tension of 23 mm. of mercury (Schiotz) for the right eye; for the left eye these values were 20/100 and 40 mm. of mercury respectively. The visual fields showed gradual contraction in the right eye and an increase of the visual field of the left eye. The patient had severe progressive pain in the right eye, with considerable chemosis of the con-

TABLE 2.—*Results of Cyclodiathermy and Cycloelectrolysis for Glaucoma Secondary to Uveitis**

Tension controlled (under 25 mm. Hg. Schiotz)	Cyclodiathermy (55 eyes)			Cycloelectrolysis (14 eyes)		
With miotics	9	16%	31%	11	79%	93%
Without miotics	8	15%		2	14%	
Tension reduced (30-40 mm. Hg.)	0			1	7%	
Hypotonic	1	2%		0		
Tension uncontrolled	29	52%		0		
Enucleated	7	13%		0		
Eviscerated	1	2%		0		

Visual results	Cyclodiathermy (47 eyes)		Cycloelectrolysis (14 eyes)	
Vision improved	7	13%	5	36%
Vision unchanged	9	19%	8	57%
Vision decreased	20	43%	0	
Vision lost	11	25%	1	7%

*Cases reported include those in which operation was performed by us and by surgeons of the New York Eye and Ear Infirmary and the American Academy of Ophthalmology and Otolaryngology.

TABLE 3.—*Results of Cyclodiathermy and Cycloelectrolysis for Thrombosis of the Central Retinal Vein*

Tension controlled (under 25 mm. Hg. Schiotz)	Cyclodiathermy (10 eyes)			Cycloelectrolysis (4 eyes)		
With miotics	1	10%	20%	2	50%	75%
Without miotics	1	10%		1	25%	
Hypotonic	2	20%		0		
Tension uncontrolled	4	40%		0		
Enucleated	2	20%		1	25%	

TABLE 4.—*Results of Cyclodiathermy and Cycloelectrolysis for Ruebeosis Iridis*

Tension controlled (under 25 mm. Hg. Schiotz)	Cyclodiathermy (9 eyes)		Cycloelectrolysis (2 eyes)	
With miotics	0		1	50%
Without miotics	1	11%	0	
Hypotonic	2	22%	0	
Tension uncontrolled	0		1	50%
Uncontrolled	6	67%	0	

junctiva and marked haziness of the cornea. Cortisone, furmethide, pilocarpine (4 per cent) and neosynephrine (10 per cent) failed to relieve the condition. Tension in the right eye increased to 75 mm. of mercury (Schiotz), and vision was reduced to light perception. Cycloelectrolysis was performed on the right eye over the lower half of the globe, followed in one month by additional cycloelectrolysis over the superior half of the globe. Tension was reduced to 20 mm. of mercury but later became elevated to 75 mm. (Schiotz). Pain persisted, and the right eye was enucleated. The pathologic diagnosis was uveitis caused by sarcoidosis. Vision in the right eye was 20/200, and tension of 40 mm. of mercury has been maintained for over twelve months. The field of vision is approximately 25 degrees in all meridians.

CASE 2 *(Sympathetic Ophthalmitis and Secondary Glaucoma).*—H.G., a man aged 58, was seen by one of us (C.B.) through the courtesy of Dr. Daniel B. Kirby. The patient had undergone a cataract extraction (right eye); this was followed by severe uveitis, and the eye was finally enucleated. Sympathetic uveitis developed in the left eye, with keratic precipitates, hyphemia and congestion. Vision in the left eye was reduced to counting fingers at 6 feet (1.9 M.), and tension was 65 mm. of mercury (Schiotz). After several unsuccessful operative procedures, cycloelectrolysis was performed, followed by paracentesis, which reduced the tension to 52 mm. of mercury (Schiotz). Cycloelectrolysis was repeated. Subsequent examination revealed that vision in the left eye was limited to light perception. The tension was 20 mm. of mercury (Schiotz) and at the time of writing has been maintained for twenty-eight months.

The results of cyclodiathermy and cycloelectrolysis in 69 patients with uveitis are presented in Table 2.

Atrophy occurred in 5 eyes (10 per cent) and phthisis bulbi in 1 eye after cyclodiathermy. No serious complications were reported after cycloelectrolysis, and we prefer this procedure.

b. *Inactive iridocyclitis:* Goniotomy, or angle incision, is usually successful if the angle is wide. Cyclodialysis with sclerectomy is sometimes successful if goniotomy fails. Iridocorneosclerectomy with complete iridectomy is valuable, especially when cataract is developing or there are posterior synechiae. If the operation must be repeated and the base tension is over 35 mm. of mercury (Schiotz), one pillar of the iris is incarcerated, with little or no excision of the sclera. A necessary prerequisite, in this case, is a thick conjunctival and Tenon's capsule flap. If a sclerectomy is performed, it should be narrow, so that the wound will not filter over the iris too near the cornea where Tenon's capsule is absent. This may result in a thin-walled bleb.

6. *Blocking of the trabecular spaces by a tumor.* This is a condition that occurs but rarely. One may consider iridectomy including the tumor if the latter is small, but it is usually necessary to enucleate.

7. *Glaucoma due to vascular disease.*—a. *Hemorrhagic glaucoma:* Vascular changes in the angle due to the toxic effect of large retinal hemorrhages and

hemorrhages into the vitreous often lead to a secondary rise in tension. In these cases the angle is open in the early stages and is closed by the iris later. When the angle is wide and is crossed by many vessels, anterior sclerotomy, flap sclerotomy (Herbert or Cruise) or punch sclerectomy may suffice, but these technics are not without danger from hemorrhage. In the later stages, when the angle becomes narrow, punch sclerectomy with a small iridectomy is indicated, and if there are many vessels in the anterior chamber it may be necessary to lessen secretion of the aqueous by cycloelectrolysis or cyclodiathermy. It is possible that cycloelectrolysis is more effective than cyclodiathermy in the treatment of hemorrhagic glaucoma, but a larger number of cycloelectrolysis operations must be performed before final conclusions can be drawn.

Results of 140 cyclodiathermy and 9 cycloelectrolysis operations for hemorrhagic glaucoma revealed that in 16 per cent of cases after cyclodiathermy the condition was controlled with miotics; in 10 per cent it was controlled without miotics—a total of 26 per cent controlled (tension maintained under 25 mm. of mercury Schiotz). After cycloelectrolysis, control was maintained in 67 per cent of the cases with miotics and in 22 per cent without miotics; i.e., a total of 89 per cent were controlled (tension under 25 mm. of mercury [Schiotz]).

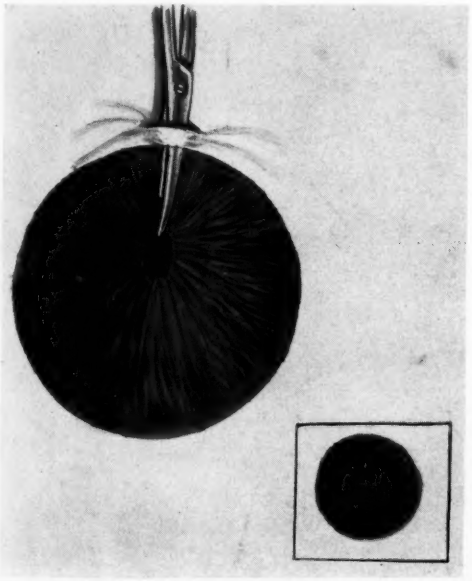

Fig. 1.—Incision with iridocapsulotomy scissors through secondary membrane and iris. Insert shows incision in iris and membrane.

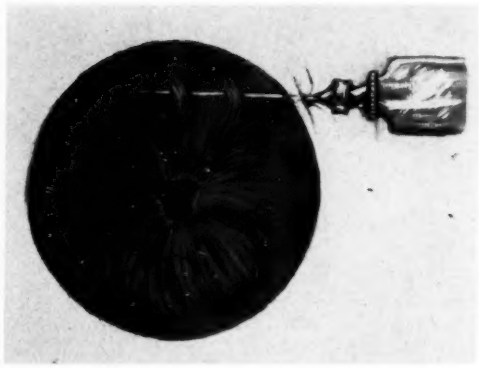

Fig. 2.—Transfixation of the iris and aspiration in iris bombé. A 27-gauge hypodermic needle is used.

Immediate shrinkage of the eyeball, which one of us (C.B.)[16] noted when the Walker bident was used to apply diathermy for retinal detachment and which was also observed and studied by Scheie,[17] is negligible when cycloelectrolysis is performed. Atrophy of the eyeball was noted in 203 eyes (19 per cent) after 1,078 cyclodiathermy operations and in only 2 eyes (1.5 per cent) after 139 cycloelectrolysis operations[18] observed over periods ranging from eight months to seven years.

b. *Occlusion of the central retinal vein (thrombosis or endothelial proliferation):* Normal depth of the anterior chamber differentiates this condition from acute glaucoma.

Some means usually must be found to reduce the secretion of the aqueous, and we prefer cycloelectrolysis combined with aspiration, paracentesis or electroparacentesis of the anterior chamber. Although cyclodiathermy with aspiration of the anterior chamber may be used, it is important to keep in mind the marked shrinking of the eyeball produced by cyclodiathermy,[19] and also the fact that

atrophy of the globe is a common complication after several years (Table 3).

If base tension is low and few hemorrhages are present, or if cataract is developing, iridocorneosclerectomy with complete iridectomy may be considered. However, in our experience, if glaucoma develops the final result is usually enucleation. The patients upon whom cycloelectrolysis was performed have not been observed long enough to enable us to report the final outcome.

c. *Diabetic rubeosis iridis:* Cycloelectrolysis is preferred to cyclodiathermy (Table 4) for this condition because there is less secondary congestion. Cyclodialysis may be effective if some area of the iris angle is free of blood vessels, and mild miotics with elevation of the head are prescribed postoperatively.

For the control of pain, retrobulbar alcohol injections into the ciliary ganglion are useful. A 30 per cent solution is used if vision is retained and a 70 per cent solution if visual acuity is greatly reduced.

d. *"Soft glaucoma" (pseudoglaucoma), possibly associated with sclerosis of the cerebral vessels:*[20] This condition is associated with loss of vision, constriction of visual fields and optic atrophy, with marginal or complete cupping of the disc. Many investigators consider this a type of glaucoma in which the increases in tension are intermittent, usually occurring at night. Duke-Elder[21] expressed the opinion that this condition is a glaucoma entity and is characterized by: (1) occurrence in persons over 50 years of age; (2) long retention of the central field, rarely progressing to blindness, and (3) occurrence in women with relatively low blood pressure in the brachial and retinal arteries. In 1932 Knapp reported 10 cases of glaucoma with persistently normal tension, in which the glaucoma was secondary to calcification of the internal carotids. McLean and Ray[22] reported similar cases. Blazar and Scheie[23] have added pituitary tumor, congenital coloboma of the optic nerve and optic atrophy due to syphilis as possible causes of pseudoglaucoma.

We agree with Ellett[24] that operation is not indicated unless increased tension can be demonstrated.

8. *Obstruction of the chamber angle by the iris.*—a. *Narrow angle glaucoma:* The depth of the anterior chamber may be the same as in wide angle glaucoma but often is shallow.

(1) *Acute congestive glaucoma:* Basal iridectomy or iridocorneosclerectomy is usually effective.

(2) *Recurrent acute glaucoma (chronic congestive):* Although this condition is usually considered "primary glaucoma," it is evident that the differentiation between primary and secondary glaucoma is often difficult. [1]Of 437 eyes clinically diagnosed as affected by primary glaucoma and studied at the Army Medical Museum, 38 showed glaucomas that were observed on pathologic examination to be secondary. This represents an error in diagnosis of approximately 10 per cent.

Broad basal iridectomy may be effective if peripheral adhesions are not too firm and the iris is not markedly atrophied. Iridocorneosclerectomy or sclerotomy with iridencleisis is preferred by us if the base pressure is under 40 mm. of mercury (Schiotz).

Iridocorneosclerectomy with incarceration of one iris pillar may be required when the base pressure is over 40 mm. of mercury (Schiotz), but the possibility of sympathetic ophthalmitis must be kept in mind.[25]

(3) *Acute glaucoma caused by blocking of the angle of the anterior chamber by the iris as the result of intumescence of the lens:* The best procedure is to extract the lens, employing avertin or sodium pentothal anesthesia or retrobulbar injection of procaine hydrochloride and hyaluronidase to lower tension. Posterior sclerotomy may have to be performed prior to cataract extraction if the tension is still high after the induction of general anesthesia and/or retrobulbar anesthesia. According to Chandler,[26] malignant glaucoma develops after anterior glaucoma operations in 2 per cent of the cases unless the lens is extracted first.

(4) *Glaucoma following cataract ex-*

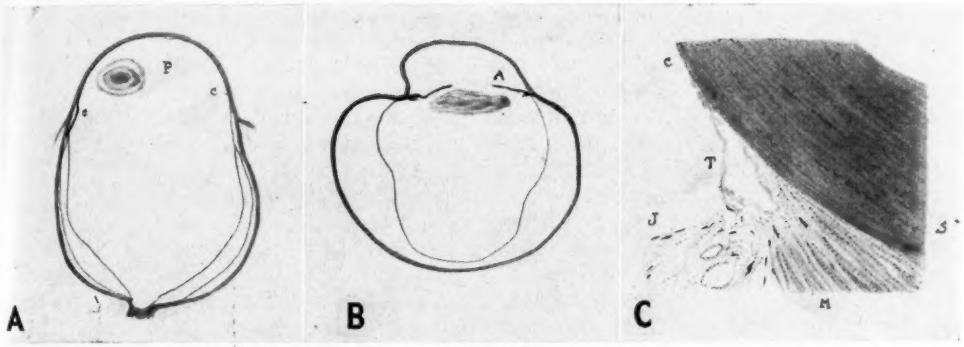

Fig. 3.—*A*, buphthalmos. Eye is markedly enlarged in all diameters and sclera thinned. Ciliary body (*c*) has completely atrophied. In place of cornea, there is a thin membrane with a pigment layer on its posterior surface: staphyloma of cornea. Iris is totally prolapsed and converted into a cicatrix, completely obliterating anterior chamber. Subsequent hypertony caused ectasia at first only of cicatrix, later of whole eyeball. Optic disc became totally cupped as result of increased tension. Lens is spherical, since fibers of suspensory ligament ruptured in consequence of ectasia. *B*, hydrophthalmos. Eye is enormously increased in size. Iris thin, ciliary body poorly developed and anterior chamber (*a*) extremely deep. Lens normal in shape and size. Detachment of retina is an artifact. Because of enlargement of eye, circumlental space is wide. *C*, filtration angle in hydrophthalmos. Figure shows (*J*) iris, (*M*) ciliary muscle and (*C*) cornea. No Schlemm's canal or marked scleral muscle is visible, bundles of ciliary muscle being simply in apposition to the sclera (*S*). Pectinate ligament is defective, consisting only of a few rudimentary trabecula. At *T* such a trabeculum stretches from posterior surface of cornea to iris.
(Courtesy of Dr. Adalbert Fuchs, Atlas of Histopathology of the Eye.)

traction when the angle of the anterior chamber is obstructed by the iris: Iridectomy is indicated if the iris is incarcerated or prolapsed into the wound Transfixation of the iris should be considered if iris bombé is present.

(5) *Late hemorrhagic glaucoma in which the iris obstructs the angle:* Cycloelectrolysis may be successful in lowering tension but usually has to be performed first on one half of the eyeball and then repeated to include the entire circumference of the globe.

Injection of alcohol into the ciliary ganglion may be useful as an adjunct to cycloelectrolysis. If some vision can be retained, 30 per cent ethyl alcohol is used; otherwise, 70 per cent alcohol is indicated.

(6) *Blocking of the angle by the iris as the result of air in the anterior chamber:* The clinical and experimental work of Scheie and Frayer[27] and Barkan[28] has demonstrated that ocular hypertension can result from the presence of air in the anterior chamber. The mechanism appears to be a valvelike action between the posterior surface of the air and the anterior surface of the iris which prevents the flow of aqueous from the posterior to the anterior chamber. Iris bombé and peripheral angle blockage result. The condition will not occur in the presence of an iridectomy. Aspiration of the air will relieve the hypertension.

B. SECONDARY GLAUCOMA CAUSED BY IRRITATION OF THE CILIARY PROCESSES IN CASES OF POSTERIOR DISLOCATION OF THE LENS.—The lens is extracted with a loop[29] under ultraviolet light, sutures being used on each side of the cornea to hold the eyeball forward and prevent loss of vitreous. This is combined with irrigation of the anterior chamber to float the lens forward. The eyeball should be freed from external pressure by eyelid sutures or by the use of a special speculum.[30]

C. TRAUMATIC SECONDARY GLAUCOMA.—

1. *Simple contusion:* This condition usually results in an initial rise in tension followed by a long period of hypotony. Usually the eye recovers spontaneously, but there may be persistent hypertension.

We agree with Knighton[31] that the mechanism is an upset in local neurovas-

cular control. For this reason, retrobulbar injection of 2 per cent procaine hydrochloride, epinephrine (1:1,000) and hyaluronidase is indicated as soon as possible after the injury. When the injury is observed too late for such measures, the use of mydriatics and repeated paracentesis usually stabilizes tension.

2. *Contusion with hemorrhage:* Hemorrhage into the anterior chamber often causes hypertension due to blockage of the angle. Such bleeding may not occur for three days after the trauma. Spontaneous absorption should be encouraged while mydriatics and vasoconstrictors are used. If hypertension persists, evacuation of the blood followed by irrigation of the anterior chamber with thrombin solution is indicated.

D. SECONDARY GLAUCOMA WITH SECLUSION OR OCCLUSION OF THE PUPIL.—1. *Partial seclusion or occlusion of the pupil with lens present:* Iridectomy is indicated after search for and, if possible, removal of the cause of the iritis, together with measures to combat postoperative inflammation.

2. *Partial seclusion of the pupil following cataract extraction with a round pupil:* Capsulotomy or iridocapsulotomy may suffice. If not, iridectomy is indicated, combined with capsulotomy or iridocapsulotomy, possibly incising the lower margin of the pupil radially with iridocapsulotomy scissors[32] where the pupil is drawn upward. In some cases, a radial incision into the pupil from above may be satisfactory when the pupil is not displaced upward too markedly (Fig. 1).

3. *Total posterior synechiae when the lens is absent:* Capsulotomy or iridocapsulotomy may suffice, although a basal optical iridectomy may be required.

4. *Total posterior synechiae with or without occlusion of the pupil when the lens is present:* Complete iridectomy, including the base of the iris, through an *ab externo* incision is the operation of choice.

Transfixation of the iris with a narrow cataract knife is usually successful in lowering tension when iris bombé is present. If vision is unobstructed and there are vessels on the iris, transfixation of the iris and slow aspiration with a 27-gauge hypodermic needle is practiced. By this means, injury to the vessels may be avoided and tension may lower slowly (Fig. 2). Irrigation of the anterior chamber with thrombin will usually prevent serious hemorrhage. Transfixation may be indicated as a preliminary procedure or when glaucoma is practically absolute, even though vision through the pupil is seriously obstructed.

E. SECONDARY GLAUCOMA CAUSED BY OBSTRUCTION OF VENOUS DRAINAGE:—1. *Pulsating exophthalmos and glaucoma:* Ligation of the carotid artery is usually indicated.[33]

2. *Obstruction of vortex veins:* It is important to determine and treat the cause if possible; for example, syphilis. In cases of exophthalmos following thyroidectomy in thyrotropic patients, surgical intervention may be useless until the orbit is decompressed.

Iridencleisis, oridocorneosclerectomy to produce subconjunctival filtration and cycloelectrolysis to lessen the formation of aqueous are operations that may prove successful.

3. *Cavernous sinus thrombosis:* Glaucoma secondary to this condition is rare, owing to the effectiveness of the antibiotics. The treatment is symptomatic until subsidence of the condition and its accompanying venous obstruction.

F. GENERAL VASCULAR HYPEREMIA: This

TABLE 5.—*Results of Cyclodiathermy and Cycloelectrolysis for Buphthalmos and Hydrophthalmos*

Tension controlled (under 25 mm. Hg. Schiotz)	Cyclodiathermy (13 eyes)		Cycloelectrolysis (8 eyes)	
With miotics	1	8%	4 50%	75%
Without miotics	0		2 25%	
Tension reduced (30-40 mm. Hg.)	0		1 12.5%	
Tension uncontrolled	12	92%	1 12.5%	

includes the hyperemia and changes following cerebral concussion (traumatic glaucoma) and the histamine-like reaction of endemic dropsy.

Spinal puncture, which often must be repeated, is used to lessen intracranial hypertension.

If miotics, intravenous hypertonic dextrose and the local use of vasoconstrictors fail to lower intraocular pressure, cycloelectrolysis may be indicated.

G. INFANTILE AND JUVENILE SECONDARY GLAUCOMA DUE TO HEREDITARY AND CONGENITAL ANOMALIES:

1. *Buphthalmos and Hydrophalmos:* In recent years there has appeared to be confusion in the differentiation of these conditions except on pathologic diagnosis. Most authors use the terms synonymously. We agree with Fuchs[34] that in buphthalmos the anterior chamber is absent and the posterior chamber is greatly enlarged (Fig. 3,*A* and *B*). Hydrophthalmos is characterized by an enormously enlarged globe and the presence of a deep anterior chamber (Fig 3 *B*). The cause of hydrophthalmos appears to be a fault in the development of the filtration angle, which remains in the embryonic stage. Schlemm's canal and the pectinate ligament are observed on pathologic examination to be absent or improperly developed (Fig. 2 *C*.) Buphthalmos is a true glaucoma secondary to an infantile ocular inflammation.

Since there is little hope of establishing a drainage mechanism in a patient with buphthalmos, some means of reducing the secretion of aqueous must be employed. We prefer cycloelectrolysis and do not hesitate to use it as a primary procedure.

For hydrophthalmos, goniotomy or air goniotomy[35] seems to furnish the best prognosis, and Barkan[6] reports 89 per cent improvement in these difficult cases.

If the angle of the anterior chamber is not visible because of scarring of the cornea, subconjunctival incision of one third of the angle may be beneficial. The last scleral fibers are not cut, and the pupil is constricted by miotics before and after operation.

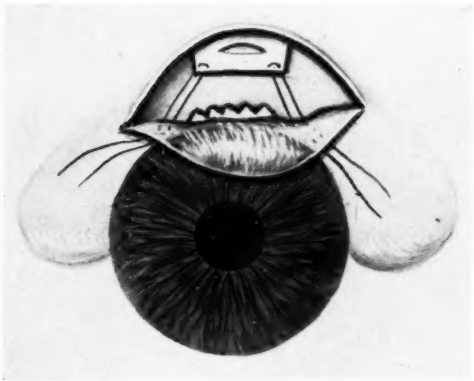

Fig. 4.—Transplantation of Tenon's capsule over sclerectomy wound to reinforce filtering bleb.

Goniopuncture is a filtering operation advocated by Scheie[7] for juvenile and congenital glaucoma. The technic is similar to that of goniotomy. Instead of sweeping the knife along the angle, the surgeon makes a counterpuncture into the subconjunctival space through the trabecular region of the corneoscleral wall and withdraws the knife. A permanent fistula is established, permitting subconjunctival drainage.

Cyclodialysis has its advocates.[36] It is valuable because little reaction is produced and the operation may be repeated. Iridencleisis has been temporarily effective at times.

Iridosclerectomy with iris inclusion has been used by us, but the conjunctival flap should be thick, and the punch sclerectomy should be narrow and placed as far as possible from the limbus. If the flap is thin, Tenon's capsule should be drawn over the sclerectomy wound with sutures (Fig. 4).

Cycloelectrolysis is an operation that should be considered if other operations fail, or possibly as a primary procedure. Scheie[37] apparently controlled hydrophthalmos with cyclodiathermy after goniotomy had failed.

Our experience with cycloelectrolysis in cases of hydrophthalmos and buphthalmos is limited to 8 eyes (Table 5). The tension was successfully controlled in these cases for periods varying from eight to

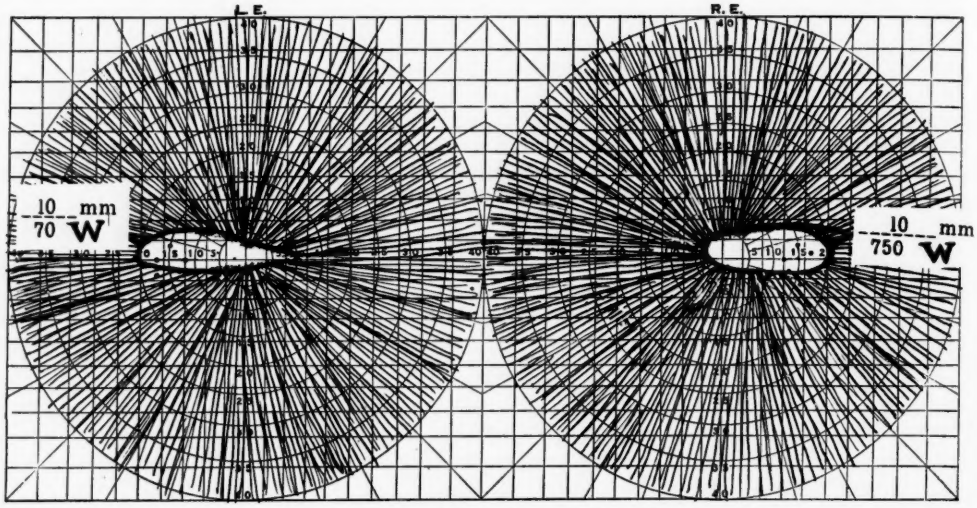

Fig. 5 (Case 6). — Preoperative (Aug. 30, 1924) visual fields of J.F., a white man aged 21 with juvenile glaucoma in both eyes. Vision, 20/70 O.D. cc., 20/70 O.S. cc. No colors seen O.U. Tension O.D., 70 (McLean).

twenty-nine months. Tension recurred in the eye of 1 patient, and cycloelectrolysis was repeated. The histories of 2 patients, one with hydrophthalmos and the second with buphthalmos, upon whom cycloelectrolysis was performed, follows:

CASE 3.—A.P., a white man aged 23, had hydrophthalmos with keratitis caused by lagophthalmos of the right eyelid. The patient was born with congental cataracts and glaucoma in both eyes and had been operated upon for cataract in infancy. Vision in the right eye was limited to light perception, and the tension was 45 to 50 mm. of mercury (Schiotz). The eyeball was greatly enlarged, and ciliary staphylomas were present. Thirty cycloelectrolysis punctures were made on the bared sclera over the lower half of the right eyeball between 2 and 4.5 mm. from the limbus, 5 milliamperes of galvanic current (cathode) being used for five seconds for each puncture with a 1.5 mm. conical needle.* Postoperative tension was reduced to 18 mm. of mercury (Schiotz), and this tension was maintained for over two years without miotics. Vision postoperatively was counting fingers at a distance of 1 foot (33 cm.).

CASE 4.—O.E., a girl aged 14, presented the following clinical picture: microcornea, both eyes (6 mm. horizontal diameter); congenital cataracts, both eyes; bilateral dacryocystitis, and bilateral ethmoiditis. Vision in both eyes was reduced to light perception. In the right eye, the tension was 60 mm. of mercury (Schiotz); in the left eye, 29 mm. The right eye was buphthalmic, the anterior chamber almost absent, and there was a coloboma of the nasal half of the iris. A ciliary staphyloma was developing. Cycloelectrolysis was performed on this eye, and the tension remained below 35 mm. of mercury (Schiotz) for twenty-six months. Cycloelectrolysis was then repeated. Vision improved to hand movements.

2. *Aniridia with hypertension:* We have operated upon only 1 patient with aniridia and glaucoma. The tension has been controlled for twenty-two months. Because de Vincentii's operation of a goniotomy seemed too hazardous, we decided, after consulting with Dr. A. B. Reese, to perform bilateral cyclodialysis.

CASE 5.—Baby M.J.P. was first seen at the age of 5 months. The diagnosis was aniridia, complete (both eyes), ocular nystagmus and infantile glaucoma (both eyes). In the right eye early glaucomatous cupping was noted, associated with failure of the macula to differentiate. The infant was able to follow light with either eye. The tension under general anesthesia was 47 mm. of mercury (Schiotz) for the right eye and 60 mm. for the left. Bilateral cyclodialysis was performed. Ten-

*Made by V. Mueller & Co., Chicago.

sion in the right eye was lowered to 25 mm. of mercury (Schiotz); in the left, to 19 mm. Pilocarpine (2 per cent) was prescribed for both eyes four times daily. On examination five months after the operation the anterior surface of the periphery of the cornea in each eye showed a gray opacity for about 0.5 mm. The outlines of both lenses were seen and were normal in size. In the right eye there was slight pallor of the optic nerve below and temporally, but no real glaucomatous cupping. The left eye showed no change from conditions observed in the previous examination. Vision seemed to have improved; the child was able to pick up small objects and seemed interested in looking out of the window.

3. *Juvenile Glaucoma*: The age of onset is usually between 10 and 40 years, and the

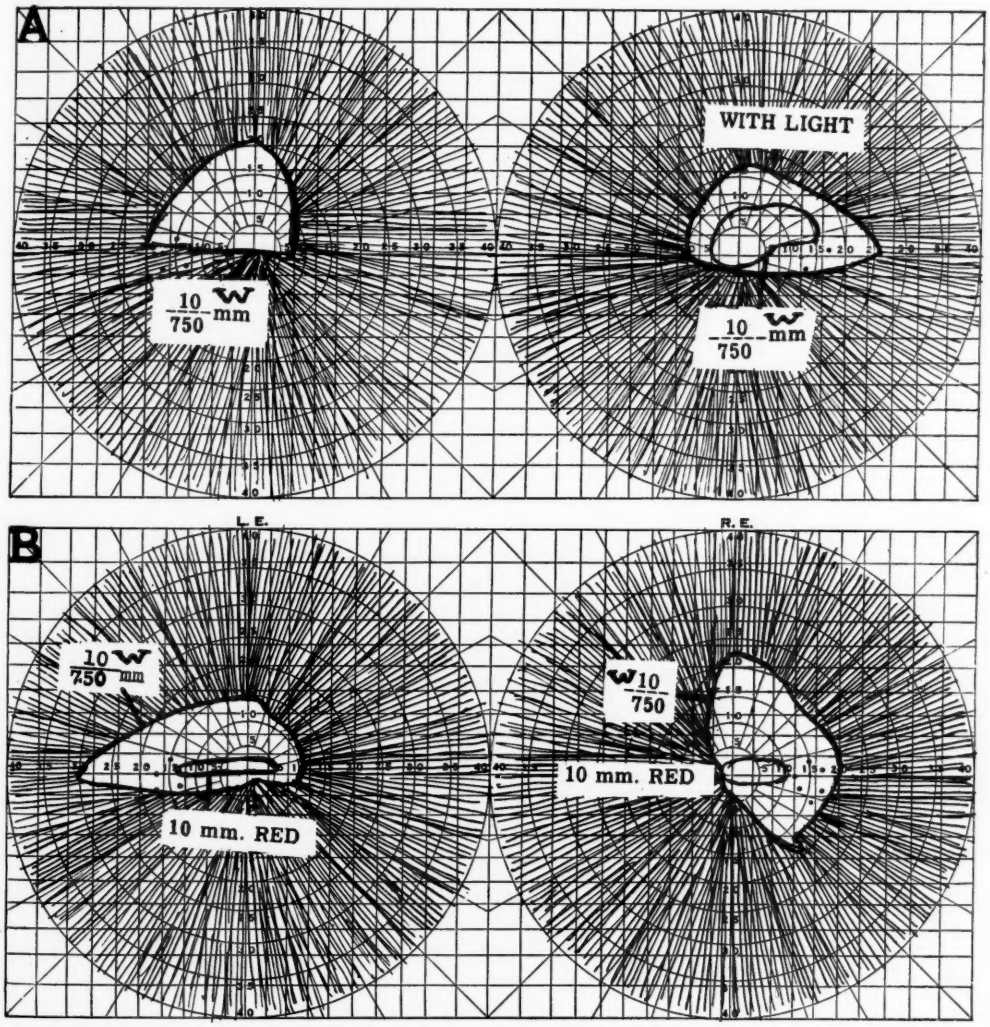

Fig. 6 (Case 6).—Postoperative visual fields of J.F. (Case 6), on whom the following operations were performed: Oct. 11, 1924, three-cut iridectomy of the left eye; October 24, same operation on right; November 3 and again November 10, paracentesis or right eye. *A*, visual fields on December 31. Vision, O.D. F. 6″; O.S. F. 6′. Tension, O.D. 25, O.S. 18. *B*, visual fields on June 8, 1926. Vision, 20/40 O.D., 20/50 O.S. Tension, 18 O.D., 16 O.S.

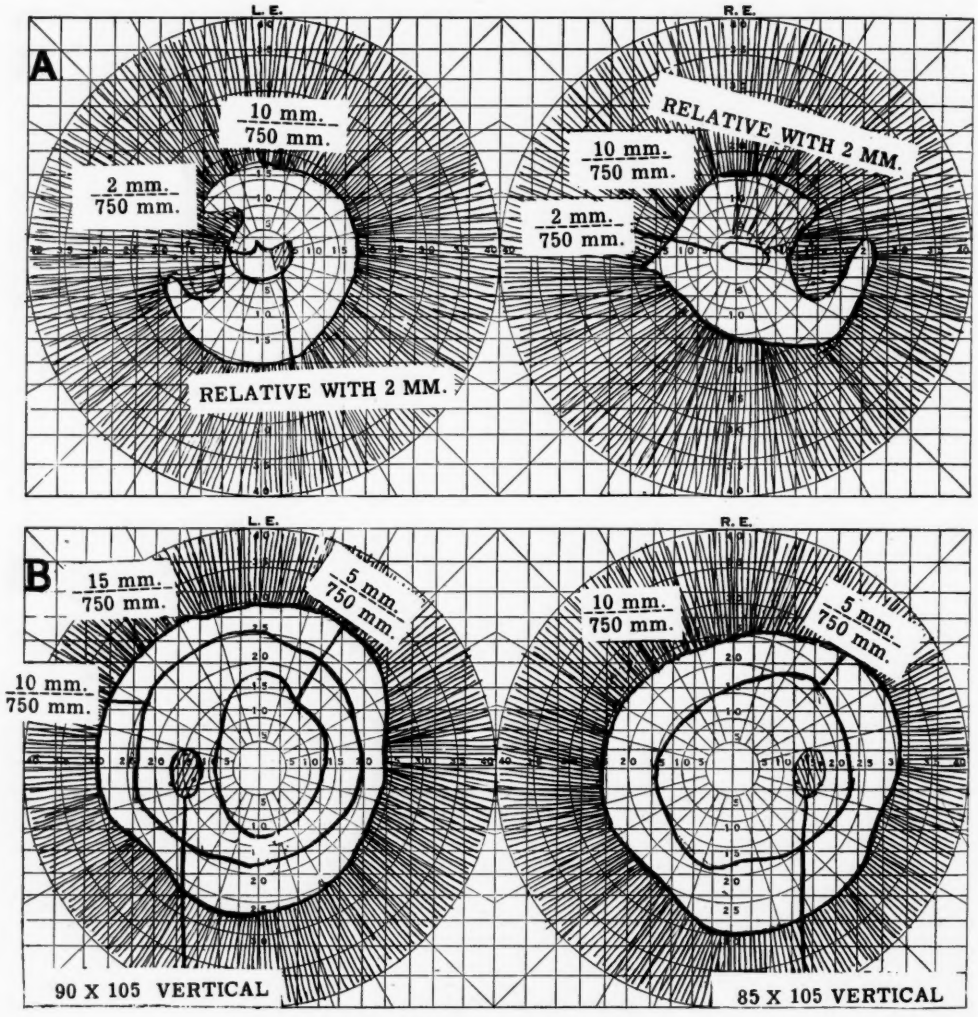

Fig. 7 (*legend on opposite page*).

condition occurs in successive generations by direct inheritance. The anterior chamber is usually shallow, and the horizontal diameter of the cornea is not increased. In the early stages, cycloelectrolysis with paracentesis or electroparacentesis is the operation which, judging from our experience, may produce satisfactory results. In the late stages of this disease, if the base pressure is over 30 mm. of mercury, and the iris is not vascularized, iridocorneosclerectomy may be successful. If the angle is wide, cyclodialysis should be considered. If the angle is narrow, iridencleisis may be indicated. Cycloelectrolysis is usually indicated if other operations fail to control tension or to prevent further deterioration of the visual fields. If cataract is developing and the iris is not too vascularized, iridocorneosclerectomy with complete iridectomy is indicated.

Basal iridectomy seems to be successful if a cause can be found, as in the following case:

CASE 6.—J.F., a man aged 31, when first examined gave a history of hazy vision and constricting visual fields for the previous eighteen months. Examination revealed: corrected vision, right eye, 20/30; left eye, 20/70. The tension was 70 mm. of mercury (Schiotz) in each eye. The fundi showed myopic changes, with marked glaucomatous cupping of both nerve heads.

A Reese three-cut iridectomy was performed on both eyes. Both operations were followed by hemorrhages into the anterior chamber, and two weeks after the operation the tension in both eyes remained elevated. When the hemorrhages had been absorbed, repeated paracentesis failed to control the tension, which remained elevated between 35 and 65 mm. of mercury (Schiotz). Vision in both eyes was reduced to counting fingers at 6 feet (1.9 M.).

A search for chronic infection at this time revealed several periapical abscesses on both sides of the upper jaw. Six teeth were extracted. Within three weeks, the tension became stabilized at 18 mm. of mercury without miotics. Vision returned to plus 20/40 in the right eye and 20/50 in the left. The visual fields were less constricted (Figs. 5 and 6).

The results of operations for infantile

TABLE 6.—*Results of Operations for Infantile and Juvenile Glaucoma (Ursin)*

	Infantile	Juvenile
Both eyes blind	27	12
One eye blind, good or satisfactory vision of other eye	37	24
Poor vision of both eyes	9	12
Good vision of both eyes	3	22

TABLE 7.—*Results of Cyclodiathermy and Cycloelectrolysis for Secondary Glaucoma Following Cataract Extraction*

Tension controlled (under 25 mm. Hg. Schiotz)	Cyclodiathermy (122 eyes)			Cycloelectrolysis (17 eyes)		
With miotics	14	12%	33%	6	38 %	52.5%
Without miotics	25	21%		3	17.5%	
Tension reduced (30-40 mm. Hg.)	8	4%		2	12%	
Uncontrolled	61	51%		3	17.5%	
Enucleated	14	12%		2	12%	
Eviscerated	0			1	6%	

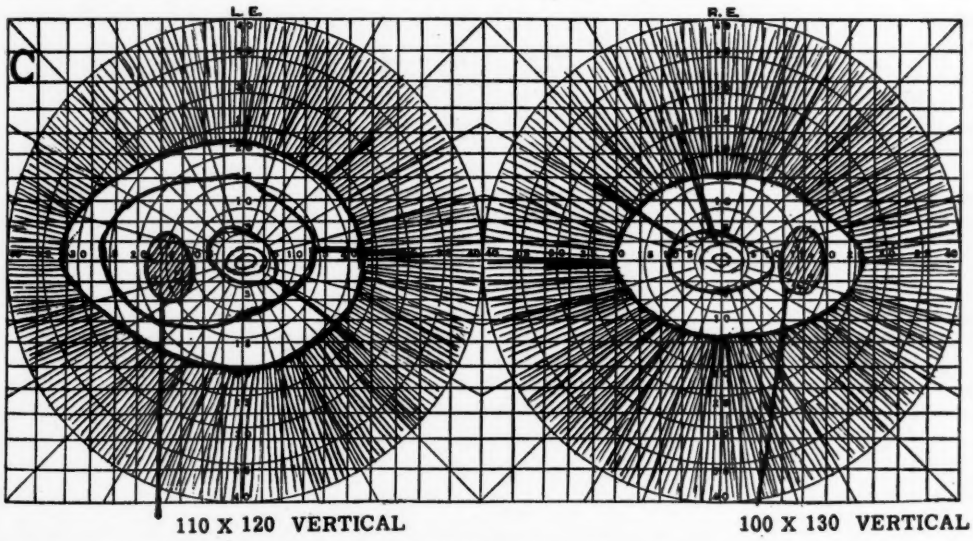

Fig. 7 (*continued*).—Visual fields in a case of bilateral secondary glaucoma associated with congenital naevus flammeus in white man aged 36. *A*, preoperative visual fields on Nov. 11, 1944. Vision cc., 20/20 O.U. Tension, O.D. 37, O.S. 47. Iridocorneosclerectomy performed on left eye March 18, 1944; same operation on right eye, March 31. *B*, postoperative visual fields on Dec. 27, 1945. *C*, marked contraction of visual fields after seven years.

and juvenile glaucoma are poor. Ursin[38] has reported them in a number of cases.

During the years 1913 to 1946, 33 cases of infantile and 25 cases of juvenile glaucoma were treated in the University Eye Clinic of Helsinki (Table 6).

4. *Secondary glaucoma associated with naevus flammeus:* A case is reported here.

CASE 7.—W.Z., a white man aged 27, had conditions diagnosed as congenital naevus flammeus, with chronic glaucoma of both eyes. Examination in 1943 revealed the following data: vision, 20/20 (both eyes); tension, 37 mm. of mercury (Schiotz) in right eye, 47 mm. in left. Marked pallor and glaucomatous excavation of the discs were present in both. The visual fields were contracted (Fig. 7 *A*).

Iridocorneosclerectomy with air injection was performed on both eyes. Postoperative observations were as follows: corrected vision, right eye, 20/15; left eye, 20/20 plus. There was an increase in the visual fields of both eyes (Fig. 7*B*). The tension was 19 mm. of mercury (Schiotz) in the right eye and 23 mm in the left, and was maintained for seven years. Examination on Feb. 5, 1951 revealed corrected vision in both eyes to be 20/20. Tension (Schiotz) was 26 mm. of mercury in the right eye and 43 mm. in the left. The visual fields were markedly contracted (Fig. 7*C*), and the optic nerves of both eyes were deeply cupped. Cycloelectrolysis and neurocatholysis were performed on the left eye. When last observed, on April 5, 1951, vision was 20/15 in each eye; tension (Schiotz) was 26 mm. of mercury in the right eye and 27 mm. in the left.

5. *Secondary glaucoma associated with neurofibromatosis:* A case is reported.

CASE 8.[39]—An infant girl was first examined at the age of 1 day. Examination of the right eye revealed the cornea to be steamy and 11.5 mm. in diameter. The cornea of the left eye was clear and measured 8 mm. in diameter. Tension in the right eye was 50 mm. of mercury (Schiotz); in the left, 25 mm. A trephine operation was performed on the right eye by one of us (C.B.) when the child was 3 weeks old, a 1.5 mm. trephine being used. The tension remained elevated, and a second trephine operation was performed three weeks later, with a 2 mm. trephine. The tension became normal and the cornea of the right eye cleared. Hypertension returned when the child was 2 years old. The orbit was greatly enlarged, and the contents encroached on the nasal cavity. When the child was 6½ years of age, examination by Dr. John Wheeler revealed no light perception in the right eye; vision in the left eye was 20/30. The right eyelid showed complete ptosis, with a tumor-like mass covering the conjunctiva and involving the skin of the lower eyelid, causing an ectropian. The right eye was buphthalmic; the pupil was rigid and fixed, and the lens was cataractous.

After enucleation of the right eye, neurofibromatous changes were observed in the ciliary body and choroid. Tags of iris, ciliary body and connective tissue were present in the trephine opening, and neurofibromatous tissue was adherent around it.

6. *Secondary glaucoma and high myopia:* Cyclodialysis is of value if the base pressure is under 35 mm. of mercury (Schiotz). Iridocorneosclerectomy with peripheral iridectomy is usually successful in eyes with base pressure over this level.

H. GLAUCOMA AND CATARACT.—1. *Before extraction:* Iridocorneosclerectomy with complete iridectomy is usually successful in lowering the tension if the cataract is immature and the lens is not swollen. If the wound is filtering, the lens may later be extracted through a laterally placed incision (Fig. 8) or an incision through the cornea below the filtering wound. Two corneal sutures are used to close the wound. If the wound is not filtering, a conjunctival flap is dissected down

TABLE 8.—*Results of Cyclodiathermy and Cycloelectrolysis for Absolute Glaucoma*

Tension controlled (under 25 mm. Hg. Schiotz)	Cyclodiathermy (196 eyes)			Cycloelectrolysis (15 eyes)		
With miotics	34	17%	35%	2	13%	46%
Without miotics	36	18%		5	33%	
Tension reduced (30-40 mm. Hg.)	2	1%		3	20%	
Hypotonic	2	1%		0		
Tension uncontrolled	98	51%		2	13%	
Enucleated	24	12%		2	13%	
Eviscerated	0			1	7%	

and a section is made with a keratome or Graefe knife through the site of the previous operation and enlarged with Stevens scissors or special corneal scissors.

2. *After extraction:* Cyclodialysis has been successful in controlling tension if the base pressure is not too high (lower than 40 mm. of mercury Schiotz). However, the possibility that an underlying cause may be present must always be kept in mind. Search for and elimination of chronic infection is indicated. If the base pressure is over 40 mm. of mercury, cycloelectrolysis should be considered; it has been effective in controlling tension in several cases in which cyclodialysis has failed. We prefer cycloelectrolysis to cyclodiathermy because postoperative reaction is less and atrophy of the globe is rare (Table 7).

I. SECONDARY GLAUCOMA CAUSED BY DISLOCATION OF THE LENS INTO THE ANTERIOR CHAMBER.—Immediate extraction of the lens is indicated under a previously

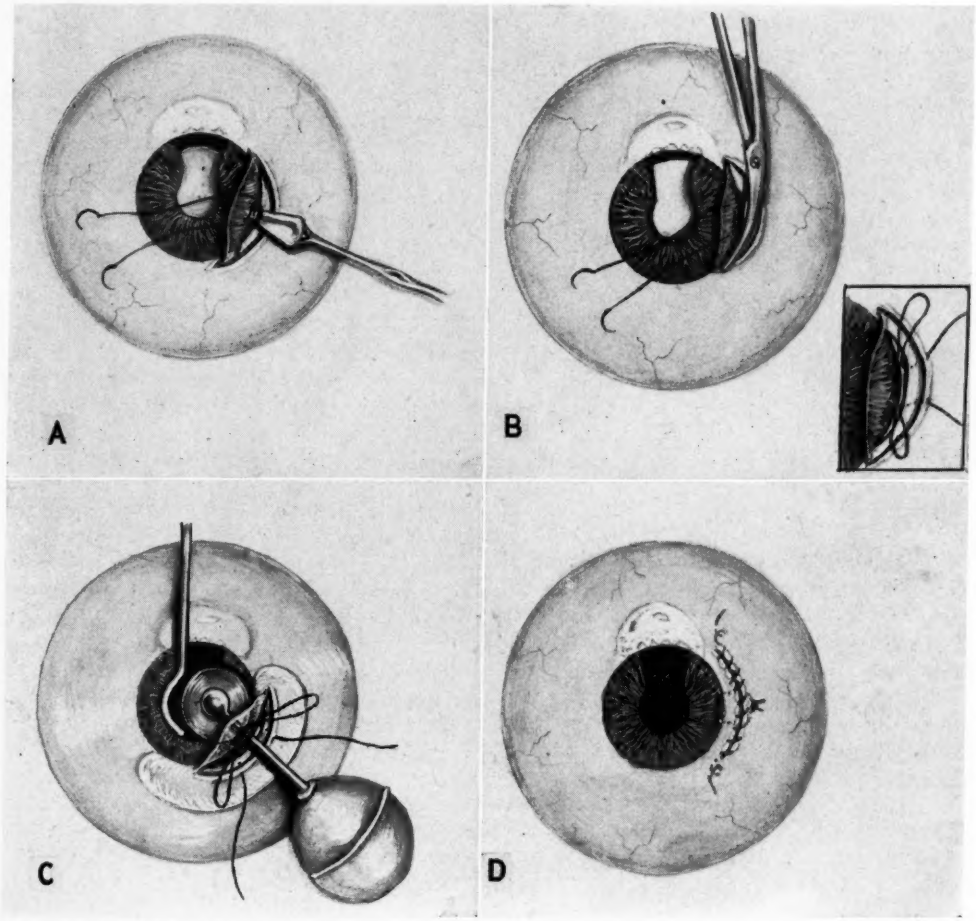

Fig. 8.—Lateral incision for cataract in the presence of a filtering wound with complete iridectomy. *A*, 3-mm. conjunctival flap made laterally after placing of a suture (No. 6-0 mild chromic catgut) in the cornea as shown. *B*, wound enlarged with scissors. Corneoscleral sutures are completed (insert). *C*, lens is extracted. Bell erisophake used. *D*, conjunctival wound closed with catgut (No. 6-0 mild chromic).

prepared conjunctival flap and with preplaced corneoscleral sutures. The tension should be lowered by a retrobulbar injection of procaine, hyaluronidase and epinephrine hydrochloride, or by avertin anesthesia.[40]

J. GLAUCOMA SECONDARY TO SWELLING OF THE VITREOUS.—The Lindner[41] procedure of producing a posterior vitreous fistula is valuable. The sclera is trephined 8 mm. behind the limbus, through an area previously treated with surface and penetrating diathermy. The underlying choroid is perforated and the intraocular fluid is aspirated.

ABSOLUTE GLAUCOMA.—Alcohol (70 per cent ethyl) injection of the ciliary ganglion is sometimes successful in relieving pain and stabilizing tension. Opticociliary neurotomy is valuable, according to Arruga.[42] We prefer cycloelectrolysis to cyclodiathermy for the control of tension, because the reaction is less and possibly results are better (Table 8).

The number of cases in which cycloelectrolysis was employed for absolute glaucoma are too few to permit final conclusions as to its value as compared with cyclodiathermy. However, the results of cycloelectrolysis seem to be somewhat better than those of cyclodiathermy (Table 8).

SUMMARY

A classification of the various forms of secondary glaucoma is presented, and the surgical procedures to be considered in the management of each type are discussed.

As with primary glaucoma, the surgeon in many instances is limited to treating the end result rather than the cause. This fact should not discourage him from careful study and classification of each case. Whenever possible, the underlying cause should be found and eleminated; for example, glaucoma capsulare, glaucoma secondary to intumescent lens, or swelling of the vitreous.

When no cause is evident, or when a known cause cannot be treated or eliminated, some means of reducing ocular tension must be employed.

For this purpose, two types of procedure are available: (1) external or filtering operations and (2) operations for the reduction of aqueous secretion.

The selection of operations for secondary glaucoma will be influenced greatly by accurate surgical diagnosis. Although a filtering operation is indicated for inactive iridocyclitis, certain conditions will require reduction in aqueous secretion for effective control of ocular hypertension (hemorrhagic glaucoma, active chronic uveitis, and conditions for which filtering operations have failed or usually fail, as in Negroes).

For many years we have reserved operations designed to reduce the production of intraocular fluid for hopeless cases and as a last resort after other operations had failed. As the indications for cycloelectrolysis have been clarified by experience, we do not hesitate to use it as a primary procedure in certain cases.

RIASSUNTO

Viene presentata una classificazione delle varie forme di glaucoma secondario e vengono discussi gli interventi da prendere in considerazione nella cura di ognuna di esse.

Come avviene pei glaucomi primitivi, il chirurgo in molti casi è costretto a curare gli esiti piuttosto che le cause. Ciò non deve dissuaderlo dallo studio accurato e dalla classificazione di ogni caso. Ogni volta che sia possibile deve essere identificata ed eliminata la causa che sostiene la malattia (glaucoma capsulare, glaucoma secondario ad intumescenza del cristallino, ecc.).

Quando nessuna causa sia evidente oppure sia impossibile eliminare una di quelle note, occorre in qualche modo ridurre la tensione oculare. Allo scopo ci si può avvalere di due tipi di interventi: 1) operazioni filtranti e 2) operazioni per la riduzione della secrezione dell'acqueo.

La scelta degli interventi per glaucoma secondario risentirà l'influenza di una ac-

curata diagnosi. Così, in certe condizioni patologiche (iridociclite in fase di quiescenza, idroftalmo, ecc.) sarà indicata una operazione filtrante, mentre in certe altre (glaucoma emorragico, ostruzione delle vene vorticose, ecc.) sarà indicata la riduzione della secrezione dell'acqueo in modo da ridurre l'ipertensione oculare.

Per molti anni quest'ultimo tipo d'intervento venne riservato ai casi senza speranza o come estrema risorsa dopo che le operazioni filtranti avevano fallito il loro scopo. Ora però che conosciamo sempre meglio le indicazioni della ciclo-elettrolisi non esitiamo, in certi casi, a servircene come procedimento di scelta.

SUMÁRIO

A classificação de varias formas de glaucoma secundario é apresentada e o processo cirurgico á ser considerado no manuseio de cada tipo é discutido.

Como nos casos de glaucoma primario, o cirurgião em muitas circunstancias é restringido a tratar os resultados finais mais do que a causa. Isso não o deve desencorajar de emprehender um cuidadôso estudo e classificação de cada caso. Sempre que possivel, a causa oculta deve ser achada e eliminada (glaucoma capsular, glaucoma secundario a cristalino intumescente, etc.).

Quando nenhuma causa é evidente, ou uma causa conhecida não póde ser tratada ou eliminada, meios de reduzir a tensão ocular devem ser empregados.

Com essa finalidade dois tipos de processos saõ utilizaveis (1) operações de filtragem e (2) operações para redução da secreção aquósa.

A seleção de operações para glaucoma secundario será influenciada enormemente por diagnostico cirurgico acurado. Ainda que uma operação de filtragem seja indicada para tais condições como iridociclite cronica, hidrophtalmo, etc., certas condições requerem redução na secreção aquósa para reduzir a hipertensão ocular (glaucoma hemorragico, obstrução de veias do vertice, etc.).

Por muitos anos nós temos reservado o ultimo processo para casos desesperados e como ultimo recurso, depois que as operações de filtragem fracassaram. Estamos cada vez mais familiarizados com as indicações para cicloelectrolise e, em certos casos, não hesitamos em usal-os de entrada.

ZUSAMMENFASSUNG

Es wird eine Einteilung der verschiedenen Formen des sekundaeren Glaukoms vorgelegt, und die zur Behandlung der einzelnen Typen in Betracht zu ziehenden chirurgischen Verfahren werden eroertert.

In vielen Faellen muss sich der Chirurg aehnlich wie in Faellen von primaerem Glaukom darauf beschraenken, die Folgezustaende und nicht die Ursache der Erkrankung zu behandeln. Das sollte ihn aber nicht abschrecken, jeden einzelnen Fall sorgfaeltig zu beobachten und zu klassifizieren. Wenn irgend moeglich, sollte die Ursache der Erkrankung gefunden und ausgeschaltet werden (kapsulaeres Glaukom, Glaukom als Folge von Linsenschwellung usw.).

Wenn die Ursache unbekannt ist oder, falls bekannt, nicht ausgeschaltet werden kann, so muss irgend ein Weg zur Herabsetzung des Augendruckes beschritten werden.

Zu diesem Zwecke stehen zwei Behandlungstypen zur Verfuegung, naemlich 1.) die filtrierende Operation und 2.) doe Operationen zur Einschraenkung der waessrigen Ausscheidung.

Die Auswahl der Operation eines sekundaeren Glaukoms haengt in hohem Masse von der genauen chirurgischen Diagnose ab. Waehrend filtrierende Operationen in Faellen von inaktiver Iridocyclitis, Hydrophthalmus usw. angezeigt sind, erfordern gewisse andere Krankheitszustaende (haemorrhagisches Glaukom, Verstopfung der Venae vorticosae usw.) eine Drosselung der waessrigen Ausscheidung, um den Augendruck zu senken.

Die letztere Methode wurde viele Jahre

hindurch nur in hoffnungslosen Faellen und als letztes Zufluchtsmittel, wenn filtrierende Operationen fehlgeschlagen hatten, angewandt. Wir werden aber mehr und mehr mit den Indikationen zur Zykloelektrolyse vertraut, und in gewissen Faellen zoegern wir nicht, sie als das primaere Verfahren anzuwenden.

RESUMEN

Se presenta una clasificación de las diversas formas de glaucoma secundario y se discute el procedimiento quirúrgico que debe considerarse para cada tipo.

El cirujano se vé constreñido en muchas ocasiones a tratar el efecto y no la causa, como en casos de glaucoma primario. Este hecho no debe desanimarlo del estudio y clasificación cuidadosos de cada caso. Cuando sea posible debe encontrarse la causa predominante y eliminarla (glaucoma capsular, glaucoma secundario a lentes intumescentes, etc.).

Cuando no existe causa evidente o una causa conocida no puede ser tratada o eliminada, deben emplearse algunos medios para reducir la tensión ocular. Dos tipos de procedimientos pueden utilizarse con este objeto: (1) operaciones filtrantes; (2) operaciones para reducir la secreción acuosa.

La selección de operaciones para glaucoma secundario estará influenciada grandemente por el diagnóstico quirúrgico exacto. Aun cuando una operación filtrante esté indicada para estados como iridociclitis inactiva, hidroftalmos, etc., ciertos estados requieren reducción de la secreción acuosa para reducir la hipertensión ocular (glaucoma hemorrágico, obstrucción de las venas en remolino o vasa vorticosa, etc.).

Los autores han reservado por muchos años el último procedimiento para casos desesperados y como último recurso cuando las operaciones filtrantes han fracasado. Consideran cada vez más las indicaciones para cicloelectrolisis y en ciertos casos no dudan en usarlo como procedimiento primario.

RÉSUMÉ

On présenteune classification des diverses formes du glaucôme secondaire avec le traitement chirurgical de chacune de ses variétés.

Tel dans les cas de glaucômes primaires, souventle chirurgien doit se contenter de traiter les résultats éloignés plus que la cause initiale. Cecine doit pas cependant l'éloigner de rechercher la cause par l'étude du cas et de la classifier. De la sorte, cette cause con trôle est trouvée et éliminée (glaucôme capsulaire, glaucôme secondaire à des lentilles boursoufflées). S'il est impossible de déterminer la cause ou si elle est connue, on ne peut la traiter ou l'éliminer, on doit trouver un moyen de réduire la tension oculaire.

Pour arriver à ce but on suggère deux méthodes—à savoir: 1. une opération filtrante, 2. une opération pour réduire la sécrétion aqueuse.

Le choix du procédé opératoire dépend beaucoup du diagnostic précoce. Si uneopération filtrante est recommandée pourdes cas tels que l'iridoclycite inactive, l'hydrophtalmie, d'autres conditions réclament une réduction de la sécrétion aqueuse afin de faire baisser l'hypertension oculaire (glaucôme hémorragique, obstruction de veines du Vortex).

Pendant longtemps le procédé était réservé aux cas désespérés et comme dernier ressort après l'èchec des opérations de filtration. Avec la familiarisation du procédé de cyloélectrolyse, on s'en sert même comme traitement initial.

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The Menacing Specter of Chronic Aural Suppuration

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OVER twenty-five years ago, as a young otologist, I went to my chief, Dr. Norval H. Pierce, and bemoaned the fact that, on the basis of the accepted indications for operative intervention—spontaneous and persistent aural pain so severe as to disturb sleep and occurring between the fourth and the sixth week of suppurative otitis media; a profuse discharge or a sudden cessation of discharge in the presence of protracted fever or a sudden rise in fever; a swelling over the mastoid; tenderness over the antrum or mastoid tip; sinking or sagging of the posterior canal wall; marked hearing impairment and possible signs of intracranial extension of the pathologic process—I had recommended a mastoidectomy; whereupon a consultant called in to see the patient had decided against surgical intervention of any kind. Dr. Pierce replied by telling me an experience of his own. He had recommended operation on the basis of evidence of intracranial extension (fever, headache, vertigo, chills, vomiting, change in sensorium, pain, tinnitus and loss of hearing) in a patient who presented unmistakable signs of lateral sinus phlebitis. A general surgical consultant was summoned and advised that an emplastrum be applied to so remote an area as the region above the coccyx! Dr. Pierce added that the particular consultant was one who, in those times, was known as a "16 to 1 operator", i.e., one who performed appendectomy, shortening of the round ligament, a gallbladder procedure, etc., in one "sitting"; in other words, not a very conservative man so far as surgery in general was concerned, and one to whom an "exploratory" abdominal operation was a commonplace procedure when any doubt arose, especially if the safety and the future of the patient were in question.

Nowadays, it is to be hoped, surgeons have a maturer understanding of what constitutes an exploratory procedure. Be that as it may, I am constantly reminded that certain Biblical admonitions with regard to "standing in judgment" of one's fellowman, "casting the first stone" and "doing unto others" have curiously modern applications. Moreover, since I am citing aphorisms, I might convincingly allude to "ignorance is no excuse"—especially when it exists at the expense of the patient, economically or socially, and to such an extent that the death-dealing properties of a disease are completely ignored.

What actually decided me to present my subject in such ominous words as "menacing specter" is contained in the following letters, which are part of a correspondence that passed between myself and a certain otologist. The names of the physicians or the hospital involved would serve no useful purpose; furthermore, the conditions reflected in this correspondence are by no means unusual anywhere in the United States today.

Dear Doctor Lederer:

Although I am not personally acquainted with you, I was more than interested in your article in the *Archives of Otolaryngology* (52:533-537, Oct. 1950) which you called the "Maginot Line of Otology", because it contained many facts about the negative effects of antibiotics on irreversible pathological changes which exist in our field, including—and probably most importantly the ear.

I, probably as much as any practising otologist, was at first "taken in" by the marvels that these new drugs were supposed to perform on chronic discharging ears, but gradually, after a number of failures, I began to operate on those ears classed as Lillie's groups 3 and 4. I did this probably in spite of the prevailing opinion of other otologists in my town, none of whom have performed a mastoidectomy in several years.

From the Department of Otolaryngology, University of Illinois College of Medicine.
Read at the Sixteenth Annual Assembly of the United States Chapter, International College of Surgeons, Chicago, Sept. 12, 1951.
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As a consequence, if you will read the enclosed copy of a letter I received from my hospital, I have myself in a "peck of trouble," the end of which I cannot foretell. I refuse to sit back and be judged as a malicious otologist by a group of general physicians and surgeons without attempting at least to defend myself. As a consequence, I must take a stand in this affair soon.

I have planned to write a complete paper on mastoiditis, its diagnosis and treatment. To justify the number of mastoidectomies I have done, I must be in a position to state that other otologists have and are doing mastoidectomies for chronic discharging ears, where indicated.

I wonder, Doctor Lederer, if you would tell me how many mastoidectomies—simple, modified and radical—you have performed in a similar period of time, or how many have been performed in the various institutions where you serve as the Chief of Service? This would be invaluable information to me.

The facts as stated in the accusation against me are not entirely true, since I had 10 and not 11 operative cases over a period of one and a half years. This small group is made up of seven modified procedures, one radical and two simple mastoidectomies. Except for the two simple mastoid procedures, the patients all had long histories of chronic discharge, some with exacerbation and pain. All of the perforations in the tympanic membrane were marginal and located posteriorly or in the attic region, and the discharge was foul smelling. The majority of them had the benefit of previous medical management without avail and gladly acquiesed to surgery. The x-rays showed either bone destruction of the mastoid cells or sclerosis in all cases. The mastoidectomies were all performed without incident and my patients tell me they are satisfied with my work and some are enthusiastic boosters.

Why this record does not stand at my hospital I do not know but intend to find out. In the process of finding out I believe the best approach is through a paper, personal presentation of the patients, and a staff discussion.

Sincerely yours,

John Doe, M.D.

The letter from the Executive Committee referred to in the otologist's communication to me follows:

Dear Doctor John Doe:

About a month ago, a complaint was referred to me in my capacity as Chief of Staff of the Average American Hospital. It was stated that an excessive number of mastoidectomies were being performed in our hospital.

I asked the Surgical Committee to make a comparative study of the number of mastoidectomies done in our own and several other hospitals. Their findings were rather startling. One hospital of about our size reported no mastoidectomies in the past one and a half years; one university hospital of about 1,000-bed capacity had only two such operations in the past one year, while ours, The Average American Hospital had a record of eleven mastoid operations in the past one and a half years. You were the surgeon in every case!

At its meeting today, the Surgical Committee recommended that a competent consultant confirm the findings and need for operation before a mastoidectomy is scheduled, and that a well qualified M.D. be present to assist with the surgery.

The Executive Committee met later today and approved of the above recommendations; with the further stipulation that the consultant must be endorsed as competent by the Surgical Committee.

The Executive Committee decided that a letter should be written to you, outlining the above findings and recommendations. We believe that if this procedure is adhered to, the surgeon and the hospital will be protected against charges of doing unnecessary operations.

We trust that no further action will be required in this matter. However, if you wish to discuss it with the Executive Committee, we will call a special meeting for that purpose.

Very truly yours,

I. M. Tops, M.D.
Chief of Staff

It now becomes necessary to clarify the status of the otologist under question. Either he is good enough to enjoy hospital privileges as a certified specialist or he does not merit his position. The fact that a certain University hospital had only two mastoid operations in one and one-half years is not valid as an argument. Statistics often depend heavily on the trend and reputation of a clinic and the particular interests of its attending staff. As I told "Doctor John Doe", "Statistics may be likened to the usefulness of a lamp post for the drunk; a source of support but no illumination." Then, finally, who are the members of this Surgical Committee that wishes to sit in judgment? They are the pillars of medical and surgical society who presume to know all and set up rigid codes of surgical conduct without recognizing the significance of what they are looking at. They are the same prognosticians who would say "He will outgrow it", or "As long as the ear runs it's good." They are the same practitioners who worship those false prophets, the antimicrobial agents, until the hearing deficit becomes a burdensome social handicap or

until opisthotonos and the mortuary become synonymous goals. They are the same implacably hostile and uncompromising medical men whose false sense of security leads them to believe that they have saved their patients from the hands of the otologic surgeon, who has devoted his life to the study and interpretation of diseases of the ear, dogmatically substituting a form of therapy that subjects their patients to the unpredictable ravages of middle ear suppuration, with its by-products of handicapping hearing loss, to say nothing of disagreeable and frequently fatal intracranial complications. In a world that places a premium on ability to get along in a competitive society, emphasis has been placed on getting people to their doctors for frequent physical examinations so that disease, when present, can be detected early. Today, the social and economic toll of chronic otologic disability is staggering. The report of my experience in World War II[1] stated that in 40 per cent of cases of aural disease the condition existed prior to the patient's entry into service. Many of the conditions observed were the result of suppurative disease. Many were caused by neglect and improper treatment. The patients probably were advised by those narrow, emotional, hard and uncompromising practitioners who could not interpret what they were looking at and concluded by saying "ENT essentially negative."[2]

Ignorance and traditional conflicts between the general surgeon and the specialist must never cloud the issue. The Surgical Committee, the Executive Committee and the profession must either inform themselves of the basic concepts of ear disease or permit those with adequate knowledge to determine why, when and how to intervene surgically in cases of mastoid disease. The new creed must always be motivated by knowledge, training and experience. Let us not become surgical robots, having such confidence in the salvaging properties of antimicrobial agents, the quality of our manual dexterity and the complacency that comes with this scientific age of development, that we think we can afford to disregard basic knowledge of anatomy and pathophysiology.

No evaluation of the present status of otology can be made without paying homage to otologists of the past and present who have contributed to the knowledge of the field. Although at times we have been shackled by traditional practices, there have been those among us who were courageous enough to venture new concepts and variations of technic. Throughout the historical progression of events, characterized by gradations of enthusiasm for medical or surgical treatment, there have always been those men who, in evaluating their cases, carefully scrutinized the fundaments of anatomy, physiology and pathology so as to keep otologic surgery within the bounds of reason. It can readily be appreciated that a wide chasm separates the *surgeon,* who may be described as the technician whose skill is fortified by excellent surgical judgment, and the mere *operator* who lacks the ability to achieve such coordination. A study of the history of otologic surgery will not only uncover past vicissitudes, failures and successes but will point out the road to the goal of every conscientious surgeon. We cannot hope to reach men who are wholly unfit or incompetent, because they are neither emotionally nor intellectually within our fold, but we who are justly entitled to recognition as specialists should pause in our daily tasks to take stock and discover whether we have left any lacunae unbridged.[3]

Since this discussion concerns itself with chronic aural suppuration, I shall make some brief comments on acute middle ear suppuration, since it is related to the subject at hand. An erroneous concept is being promulgated, namely, that the antimicrobials have eliminated middle ear disease and surgical mastoiditis.[4] Suffice it to say that these entities demonstrated variations in number and degree even before the sulfonamide era, and the dictum indicating surgical drainage of a suppurative focus has not been changed.

Dependence on antibiotics has caused many patients to be carried through and beyond the acute phases of middle ear and mastoid disease to enter the limbo of otogenic complications. This is the result of premeditated neglect, offering up the patient to the unpredictable ravages of hearing disability, meningitis, brain abscess, lateral sinus phlebitis or facial paralysis. The development of chronic suppuration superimposed upon an acute inflammation of the middle ear may be looked upon by the patient as a petty annoyance; he may complain mainly, or only, of the fetor of the discharge; but the physician must realize that a discharging ear is a tinder-box, the smouldering embers of suppuration slowly continuing as a latent process and awaiting the ally of destruction, namely, acute exacerbation. Not so well recognized or understood is the pathologic process that take place during the latent period. If it were, physicians would view with considerable alarm the very thought of conservative medical management, which is completely inadequate; they would not attempt to reconcile a scientific code with the absurd theory that a surgeon who opens a mastoid is avaricious, self-seeking, and interested solely from an economic standpoint.

It is true, and always has been true, that chronic suppurative otitis media in the majority of cases will respond to nonsurgical remedies. In these cases there are perforations in the anterior-inferior quadrant or in the central portion of the tympanic membrane, but there is nothing that threatens the life of the patient. Therapy is directed, therefore, toward clearing up infection at its source (in the nose, sinuses, nasopharynx and pharynx) and providing proper hygienic treatment of the middle ear (inflation of the eustachian tube and insufflation of dry powders or instillation of alcoholic solutions through the perforation).

Least understood of all, and greatly mismanaged, are the chronic discharging ears that are associated with marginal or attic perforations that fail to clear under medical treatment. A better basic knowledge of the underlying pathologic changes associated with this common manifestation of aural suppuration will serve to prevent generalizations, which in the past have led to controversies and consultative bickerings. Moreover, the life of the patient is jeopardized by the clinician who would await some remarkable gross change, meanwhile overlooking the significant minutiae so well known to the trained otologist. The pathologic process of cholesteatoma is likened to the peril of the iceberg for the mariner, for that which is visible above the surface of the water offers less of a threat to the ship's course than does that which is hidden.[5]

There are two anatomic characteristics in particular which are significant of fully developed cholesteatoma: 1. There is, as a rule, only one cavity, which has smooth walls and lies in a compact bone. 2. The walls of this cavity are always lined by a high squamous epithelial layer. The so-called "ingrowth theory" explains the second point, in particular, by the fact that the epidermis of the external canal grows into the middle ear. This theory has heretofore enjoyed great popularity,[6] but it does not explain why this epidermis grows into the middle ear; furthermore, it does not in itself account for the fact that only one cavity is present in a sclerotic mastoid bone. The latter fact is usually explained by the supposition that the original pneumatic tendency or formation of the temporal bone is altered into a sclerotic one by an inflammatory process. I do not subscribe to this theory, because observations of a transition between a pneumatic and a sclerotic process are lacking and because present knowledge in general does not favor this explanation.

The aforementioned data explain why some otologists have proposed another theory of the development of cholesteatoma, namely, the "tumor theory." They suggested that a primary tumor was present in such cases, analogous to a dermoid cyst or a primary cholesteatoma of the skull, and that this tumor became secondarily infected. I do not subscribe

to this theory, because the occurrence of a primary cholesteatoma in a middle ear that is not infected belongs to the extreme rarities.[7] In order to explain the possibility of such a primary process, some otologists advance the thought that cholesteatomas of the middle ear, if not infected, produce so few clinical symptoms that they are usually unrecognized.[8] As far as proof by autopsy is concerned, the mastoid processes are unfortunately not always routinely opened, and such disease could be readily overlooked. However, Brunner examined several hundred temporal bones microscopically and has personally reported to me that he has never found evidence of a primary cholesteatoma. Consequently, he believes that primary cholesteatomas of the middle ear occur seldom, if at all.

According to my own observations, I present the following concept for consideration: The anatomic basis for the development of a primary cholesteatoma in every case of chronic otitis media is the hyperplastic state of the mucous membrane and the disturbance or restriction of pneumatization of the temporal bone. In a well pneumatized temporal bone containing normal mucous membrane, a cholesteatoma cannot develop. This fact explains the presence of one cavity only, as well as the sclerosed bone in the surroundings. However, since the described anatomic basis is significant in every case of chronic suppurative otitis media, there must still be another significant factor to explain the development of a cholesteatoma. This is the presence of epidermis in the attic and antrum. At the beginning of the process, the hyperplastic mucous membranes of all spaces of the middle ear show a typical mucous membrane epithelium, and, as long as the epithelium is intact and not replaced by squamous epithelium, one cannot speak of a cholesteatoma. According to the usual concept, observations clearly demonstrate that this replacement occurs by an ingrowth of epidermis of the external canal into the middle ear, classically through a marginal perforation.

A sharp distinction must be drawn between two types of cholesteatoma. The first type develops on the basis of necrotic otitis media, such as has been observed after scarlet fever or in the presence of tuberculosis or a marked destructive process. In such instances there is no need for a sclerotic process to be present in the mastoid bone; a cholesteatoma develops only if the necrotic inflammation meets with a hyperplastic type of mucous membrane.[9] This observation is in agreement with my own concept, in that only the hyperplastic type of mucous membrane of the middle ear has a tendency to become affected by necrotic inflammation or by tuberculosis. As a rule, in these cases a small antrum and poor pneumatization are present prior to the onset of the necrotic process. When in such a temporal bone the inflammation produces necrotic destruction of the tympanic membrane and of the epithelium of the mucous membrane of the middle ear, it is obvious that, instead of the epithelium of the mucous membrane of the eustachian tube, the epidermis of the external canal grows into the middle ear. Together with this epidermis, the subcutaneous tissue, with its blood vessels and elastic tissue, also invades the middle ear. This subcutaneous tissue erodes the surrounding bone on the one hand, without any additional inflammatory factor, and on the other it nourishes the squamous epithelium layer so well that a continual desquamation of the epithelial layer occurs. These two facts explain the growth of the cholesteatoma and the steady increase of the size of the cavity within the temporal bone, which may even progress to the extent of causing destruction beyond the anatomic confines and encroaching upon vital dural and nerve structures.

Otoscopically, the picture in such cases is characterized by extensive destruction or complete absence of the tympanic membrane, as well as of the lateral ossicles of the middle ear. Consequently, all cholesteatomas in which there are but small perforations of the tympanic membrane must develop in another way.[10]

Bezold emphasized the fact that acute otitis media is seldom followed by a cholesteatoma. Witmaack, however, expressed the opinion that it is.[11] I am in agreement with Bezold, as acute otitis media rarely produces an attic perforation or a perforation of Shrapnell's membrane. In such instances the disease sets in as a progressive, insidious process.

The most outstanding clinicopathologic type is the cholesteatoma characteristically associated with a pinhead-sized perforation situated in Shrapnell's membrane. Here too the anatomic basis is a hyperplastic type of change in the mucous membranes. The question whether, in such an instance, chronic suppuration or a cholesteatoma will develop depends upon the relationship of the tubal-middle ear space on the one hand and the attic-antrum space on the other. A cholesteatoma is created only when these two spaces are well developed but separated from each other by traversing connective tissue bands. Such connective tissue bands readily develop in the course of those characteristic latent inflammations which also lead to the formation of a hyperplastic type of mucous membrane. That such bands in particular develop between the middle ear and the attic is due to the interpolation of the ossicles in this space. Consequently, one may state that for the development of an epitympanal cholesteatoma the following factors are necessary: (1) a hyperplastic type of mucous membrane associated with restriction of pneumatization of the mastoid bone, and (2) the formation of a separating connective tissue membrane between the attic and the middle ear, together with a reasonably good development of the attic region in the presence of chronic suppurative otitis media and blockage of the eustachian tube.

Naturally, when the attic is separated from the middle ear, the air therein contained is resorbed and replaced by a transudate. Simultaneously, a negative pressure must develop in the attic. The sequel of this negative pressure is the otoscopic observation that the thin Shrapnell's membrane is sucked or drawn into the attic (Prussak's space) just above the short process of the malleus. It appears as a minute dimple. I am not of the opinion that tuberculosis of the mucous membrane is commonly combined with similar changes in the attic.

To this point, my concept is almost identical with that of Bezold, except that I would stress the importance of the hyperplastic type of mucous membrane. Likewise to be emphasized is the fact that the development of cholesteatoma has no causal relation to the atrophic areas occasionally observed in Shrapnell's membrane. These atrophic areas are due to obliteration of Prussak's space and do not in themselves lead to the formation of cholesteatoma unless there is total separation of the entire attic toward the middle ear.

Perforation of Shrapnell's membrane does not alone suffice to explain the continued ingrowth of the epidermis into the attic;[12] there must also be the accompanying hyperplastic alteration of mucous membrane of the middle ear and the transverse bridges of connective tissue separating the attic from the mesotympanum. Only then, if all the aforementioned conditions are present, is it possible for the cholesteatoma to develop.

Witmaack admitted that a cholesteatoma may occasionally develop in a temporal bone which has pneumatic cells and which, therefore, does not possess the hyperplastic type of mucous membrane.[10] He emphasized the fact that these cases are exceptions to the rule, but, since he admitted that they can exist, his theory concerning the absolute necessity for the presence of hyperplastic mucous membrane presents a very weak point in the argument.

If Shrapnell's membrane is sufficiently altered so that it forms a cul-de-sac with the convexity toward the antrum, the sac may readily rupture and a small amount of serous discharge may escape into the external auditory canal. This is the period in which the cholesteatoma becomes clinically manifest for the first time. The

further changes are readily understood. The squamous epithelial layer extends farther into the attic and antrum and pushes aside the epithelium of the mucous membrane. In such instances there is squamous epithelium of the type observed in the neighboring area, while in the region of the antrum there may still remain cubic epithelium of the mucous membrane. The final result is a cavity encompassing the former anatomic terrain comprising the attic and antrum. This newly formed cavity is lined by squamous epithelium and filled with desquamated epithelium; thereby an epitympanal cholesteatoma is developed, which at the outset is entirely separated from the mesotympanum. In the later course of the developing disease the connective tissue bridge between the attic and the mesotympanum might be destroyed and the cholesteatoma might invade the mesotympanum, causing destruction of the tympanic membrane and producing a picture resembling a cholesteatoma of the type commonly observed as secondary to scarlet fever.

Not only may small cholesteatomas be associated with a tiny perforation in Shrapnell's area as has been described, but they may also combine with a minute perforation in the posterior and superior quadrant of the tympanic membrane. It is probable that in these instances the cholesteatoma develops in the same manner as do the perforations that occur in Shrapnell's membrane.

It is, of course, also possible that Shrapnell's membrane is transformed into a cul-de-sac, which does not rupture but rather joins with the hyperplastic mucous membrane of the attic. In these instances epitympanal cholesteatoma actually resembles a cystic process, the epidermal inpouching of the tympanic membrane being sucked in above the short process and later pinched off, forming a nucleus of squamous epithelium in the middle ear. Under such conditions the cholesteatoma may exist without any significant clinical symptoms, particularly without a show of discharge from the ear, and a tiny speck of cerumen-like crusted material may camouflage the minute perforation. The only symptoms that may serve to indicate the presence of a cholesteatoma are: (a) diminution of hearing and (b) the tympanic membrane picture, revealed only after the most painstaking observation and removal of the crust. So far as the latter is concerned, one sometimes is surprised to see that the cholesteatoma has destroyed the head of the malleus and even the lateral wall of the attic, although the patient may insist that there has never been any observable discharge. Such a statement is usually correct, because in these cases all destruction due to the cholesteatoma is produced by pressure necrosis rather than by infection. Also in relation to this point, the so-called "dry" cholesteatoma resembles a tumor in that it is a mass, but actually it is not recognized as a true tumor.

It is a matter of familiar clinical experience that occasionally a dry cholesteatoma may be permanently cleared up when the mass is removed through the external auditory canal by suction or curettage. According to Witmaack, there are two reasons for this clinical fact: (1) there is a large communication between the cavity and the external canal which allows the cholesteatoma to be extruded, and (2) the squamous epithelial layer shows a tendency to desquamation only if it overlies a hyperplastic connective tissue acting as a nutrient source. Again according to Witmaack, in these dry cholesteatomas the subepithelial tissue is fibrous and does not contain much nutrient material; therefore there is but little tendency toward desquamation. The same reasoning holds true for the fact that a cholesteatomatous process may heal spontaneously by the development of a so-called "natural" or "spontaneous" radical operation, and also for the fact that a dry cholesteatoma may be definitely eradicated and cured after a competently performed mastoid operation. Nevertheless, Witmaack emphasized the fact that in the radical operation it is desirable to remove as much of the cholesteatomatous matrix as possible. As a result of such a technic

a firm layer of connective tissue will be produced, which covers the bony walls and does not permit intense desquamation of the squamous epithelial layer which later covers this firm connective tissue.

It is, of course, always possible for the two types of epitympanal cholesteatoma to produce a combined form. In such instances the epitympanal cholesteatoma at first expands like a tumor and remains dry. After a period of extending, the sac ruptures. It is at this time that the dry cholesteatoma comes in contact with the mucous membrane of the attic and changes into a moist cholesteatoma, with a scanty, fetid discharge escaping from the ear. Normal mucosa of the middle ear is dry, not moist.

These combined forms explain the varying prognosis of a cholesteatomatous process. Since it was Witmaack's opinion that the posterior wall of the external canal and the lateral wall of the attic in such a process are destroyed, not by infection but rather by pressure of the mass, it is obvious that even a large cholesteatoma has a relatively good prognosis as long as it does not become infected; namely, as long as the sac remains intact and is not perforated. In these cases, even if the cholesteatoma is large, spontaneous cure has been observed by most otologists. It has been my experience that the prognosis is more serious in those cases in which there is a small perforation of Shrapnell's membrane and in which the sac ruptures early. Initially the cholesteatomatous masses in these cases come in contact with mucous membrane as a continual source of infection. The size of a cholesteatoma is, however, dependent upon the time when its development sets in and the duration of the suppurative process. It is obvious that the mass may reach very large proportions when it begins in childhood.

Finally, Witmaack mentions cholesteatomas of the hypotympanum, which, peculiarly enough, he designates as a cholesteatoma of the external canal. In his opinion these have developed in the same manner as the epitympanal types; namely, there is a connective tissue bridge that separates the hypotympanum from the mesotympanum with the tympanic membrane forming a cul-de-sac into the hypotympanum, thus producing a hypotympanal cholesteatoma. I do not know for certain whether this is true, since absolute proof is lacking. It is, of course, possible that these are the cases in which it is believed that the external canal *per se* is the origin of the cholesteatomatous mass (cholesteatoma externum). Those that I have observed produce a widened external canal in which the epidermis is thinned out, in some areas exposing bone. The typical scant, fetid thick secretion is present each time the desquamated material is removed. At any rate, these hypotympanal types are prognostically better than the epitympanal form of cholesteatoma, as they tend to heal spontaneously after the mass is removed and the area kept dry and clean.

Witmaack has described cases with the following tympanic membrane picture: There is usually one large perforation, the handle of the malleus is adherent, and the mesial wall of the middle ear is somewhat epithelialized, or, a typical antral fistula is present. The anatomic basis for such a type of suppuration is again a marked interference with normal pneumatization of the mastoid process. So far as middle ear suppuration associated with epithelialization of the promontory region is concerned, the onset of such a diseased state is the same as that of a simple mucous membrane suppuration, the only difference in these bases being the facts that a connective tissue bridge separates the mesotympanum from the epitympanum and that a part of the margin of the perforation is joined with that of the bridge. Therefore, the epidermis that grows into the middle ear covers only the region of the promontory; it does not invade the attic. Also, there may be a connective tissue bridge separating the hypotympanum from the mesotympanum, and in such instances the epidermis extends along the bridge into the mesotympanum. The conditions as-

sociated with fistulas of the mastoid antrum are similar to this, the epidermis growing along the fistulous tract into the antrum.

According to both Bezold and Witmaack, as was mentioned by the latter in discussing pneumatization of the temporal bone, epitympanal cholesteatoma is *not* a primary cholesteatoma of the ear, although many are erroneously designated as such in the literature.[13] These are actually epitympanal cholesteatomas in which the perforation of Shrapnell's membrane is so insignificant as to be overlooked by the examiner.

Diagnosis—Occasionally an inadequate history and examination may mislead the clinician into overlooking chronic suppurative ear disease associated with exacerbation or reinfection and improperly indicating simple mastoidectomy. Such an erroneous interpretation will frequently be followed by a stormy course and/or otogenic complications. The area of Shrapnell's membrane, when meticulously examined, will often reveal an epitympanal cholesteatoma, and a carefully executed roentgen technic will enable the clinician to diagnose a definitive pathologic condition in the presence of markedly restricted pneumatization or sclerotic mastoid bone. The diagnostic points in general are briefly summarized as follows:

1. Scanty, fetid discharge from the ear without acute symptoms—pain, fever, etc.—at onset of the disease. The patient frequently does not even know that a discharge from the ear is present, but occasionally notices an annoying bad odor from the ear prior to any demonstrable discharge. It is in this that epitympanal cholesteatoma is somewhat similar to the slow forms of tuberculous otitis media.

2. There is usually some diminution of hearing, although it is seldom profound. Since this mild decrease of hearing develops insidiously, the patient frequently becomes accustomed to it and states that there is no diminution of hearing at all. The patient usually notices some tinnitus. The degree of hearing loss will depend upon the duration of the process, the extent of the adhesive process and osteosclerosis.

3. Dizziness seldom is marked, as these cholesteatomas have more of a tendency to extend through the antrum into the superior angle of the pyramid than to invade the labyrinth, although fistulas of the horizontal semicircular canal produced by pressure necrosis are not unusual.

4. The most significant observation is the perforation in Shrapnell's membrane. Otologists of past decades have taught that a perforation of Shrapnell's membrane indicates a cholesteatoma in 100 per cent of the cases. This is not entirely true; it is known that occasionally, even in a case of common acute otitis media, a perforation may occur in Shrapnell's membrane without the presence of a cholesteatoma. Nevertheless, to be on the safe side and protect the future of the patient, it is necessary for the clinician to adhere absolutely to the old concepts. It should even be the rule to take particular note of the otoscopic picture of Shrapnell's membrane so as to make certain that such an entity will not be overlooked. As was previously emphasized, these perforations are at first very small and may be closed for a short time by an atrophic, indented, glistening membrane. The perforation usually lies above or in front of the short process of the malleus. Later, it becomes enlarged and includes the lateral attic wall. In the course of the necrotizing process the neck and occasionally the head of the malleus becomes exposed.

5. Functional tests of hearing usually reveal middle ear deafness of a mild degree. In patients in whom the labyrinth is involved a spontaneous nystagmus is noted, sometimes to the diseased side only, but more commonly to both sides. The caloric response is usually normal. In connection with the latter, it should be emphasized that it is erroneously believed that no danger attends doing a caloric test in a case of cholesteatoma unless the patient has a dry perforation of the tympanic membrane, and that it is dangerous then only because it may cause the ear

to discharge again. This idea is not entirely valid. If, however, the cholesteatoma is associated with suppuration, a caloric test may be carried out without so much concern, particularly if an alcoholic solution is employed. Even then an upsetting state of affairs awaits the patient as well as the clinician if caution is not exercised. It is, of course, not always simple in these cases to discover a discharge, as the secretion is frequently scanty and locked up behind a dried crust. Therefore, it is best to adhere to the old rule: If the clinician is unable to determine whether a discharge is present, cotton is inserted into the ear in the region of the perforation for twenty-four hours. If the pledget has a fetid odor after this length of time, it is to be interpreted as signifying the presence of suppuration.

6. Roentgenographic study of the temporal bone may yield information of inestimable value in the diagnosis of chronic suppuration. In cases of cholesteatoma, however, studies of the temporal bone do more than confirm the presence of a sclerotic process, for when the proper technic is employed the presence of the lesion may be not only confirmed but localized.

Prognosis.—The prognosis of epitympanal cholesteatoma is worse than that of the common cholesteatoma in which there is total destruction of the tympanic membrane. This poor prognosis has two reasons: 1. Epitympanal cholesteatoma is frequently diagnosed incorrectly or even remains undiscovered, which is far less often the case with the ordinary forms of cholesteatoma. 2. The epitympanal type lacks the facility for natural drainage that is characteristic of the secondary common type of cholesteatoma; the latter readily drains into the external canal through a large perforation of the tympanic membrane.

The poor prognosis concerns the life of the patient more than the function of the ear, although the latter is by no means to be underestimated. Epitympanal cholesteatoma can be dangerous to life in two ways: (a) by a process of insidious extension by which the tegmen tympani is slowly destroyed; an extradural abscess gradually develops, which produces no significant symptoms except a slight headache, and then, suddenly, meningitis ensues and may cost the patient his life, and (b) epitympanal cholesteatoma may become acutely inflamed after acute disease of the upper part of the respiratory tract. The mesotympanum and the hypotympanum are normal; the cholesteatoma is localized to the epitympanum only, and the patient may acquire what appears to be ordinary acute otitis media. As a matter of fact, some clinicians designate the conditions present in these cases as cholesteatoma plus acute otitis media. I seek to avoid this designation, as acute otitis media is not logically to be disassociated from the cholesteatoma by an anatomic barrier. The condition is therefore referred to as acute exacerbation of an epitympanal cholesteatoma. This point is not to be misconstrued as of merely academic importance; it is therapeutically and prognostically significant. Clinically, the patient actually exhibits some of the signs of acute otitis media. The tympanic membrane is markedly hyperemic and edematous; the perforation is scarcely visible, and there is an increase and even a pulsatory movement in what was previously a scanty discharge. Therefore, it is not too far-fetched to assume that such a condition can be readily confused with ordinary acute otitis media. However, there are certain diagnostic points that should arouse suspicion: 1. The patient is much more ill than he would be with ordinary acute otitis. 2. From the outset, slight meningeal symptoms are present, particularly high fever, which is usually absent with the common types of adult acute otitis media. 3. No marked symptoms of mastoiditis are present, as the mastoid process is characteristically sclerotic. 4. There is usually a tendency for the fetid odor to disappear from the secretions. This differentiation is very important, since, of course, the type of medical and surgical treatment of these

two types of disease is absolutely different.

Treatment.—If the ear is dry and the perforation is closed by an atrophic membrane, no active treatment need be given. Since the patients do not have any unusual difficulty, not even tinnitus, they do not seek medical aid. If the process produces a scanty discharge and no other symptoms of a beginning intracranial complication, therapy may be medical; namely, wiping with a cotton applicator saturated with carbon tetrachloride, administration of alcohol-type drops to nullify the odor and provide the basis for the dry treatment, and tubal inflations to maintain the patency of the eustachian tube. Many kinds of ear drops containing various agents, including eycerite of hydrogen and antimicrobial agents, sporadically make their appearance in the literature and then on the market in the form of some much-heralded patent remedy. Since well over 85 per cent of patients with chronic suppurative otitis media respond to almost any remedial agent, careful clinical interpretation is essential before general statements are to be construed as scientifically acceptable. The same may be said of the employment of antimicrobial agents given orally or parenterally. When used locally in accessible cavities, they are to be employed on the basis of organism sensitivity tests and not haphazardly administered. Irreversible pathologic changes, such as have been described as accompanying cholesteatoma of the middle ear and the mastoid process cannot be affected by such agents *per se*. The disease must be eradicated and a suppurative focus drained surgically, the antimicrobial agents in adequate dosage being reserved for intracranial complications of otogenic origin. Absolutely to be avoided in these cases is repeated probing of the middle ear or alcohol irrigations of the minute perforation with an attic cannula, for these may lead to acute infection of the cholesteatoma.

If the discharge is scanty and there are symptoms of a beginning intracranial complication (headache, poor physical state, vertigo, mastoid symptoms, change in sensorium, fever), of course an operation should unhesitatingly be performed. The operative technic may consist of either a modified or a conservative radical operation (leaving the ossicles and the tympanic membrane) or a complete classic radical mastoid operation. The choice between the two procedures depends on the following points: 1. The degree of hearing loss or the hearing still remaining in the good ear (if the process is bilateral). 2. The intensity or urgency of the intracranial signs. If the symptoms of meningitis or brain abscess are well defined, experimenting with a modified radical operation is risky. 3. The tympanic membrane picture on the affected side. If the mesotympanic and hypotympanal portions of the middle ear are normal, which can be proved by functional tests of the cochlea, a modified or conservative radical mastoid operation can be carried out, particularly by the endaural method. 4. The patient's condition during the operation. If the patient has a very high attic, a conservative radical operation will certainly have a better chance of healing and a dry ear ensuing, than in patients in whom the attic is low. In cases of doubt, however, it is better to perform a complete radical operation. Technically, the modified or conservative radical mastoid operation consists of removal of the bridge of the lateral attic wall and occasionally of the head of the malleus. Care must be exercised to remove the entire lateral attic wall up to the eustachian tube, because at times there are cholesteatomatous masses to be found in the anterior angle of the attic.[14] These may continue to produce recurrences of suppuration and occasionally even complications. Whether or not a plastic reconstruction of the external canal is to be carried out depends entirely on the size of the external canal. If the external canal is narrow, a plastic operation should be performed. In cases of doubt it is better to perform a plastic procedure.

The most important cases are those in which there is an acute infection (exacerbation) of an epitympanal cholesteatoma. Unfortunately, even today, these patients are badly managed owing to an erroneous concept. It is not unusual to find that in such instances the surgeon performs a simple mastoid operation, which, of course, cannot be of value even when it is done so widely as to expose the lateral sinus and the dura. It must always be borne in mind by the clinician that in these cases the focus does not reside in the mastoid proper, as it does in acute otitis media, but rather is situated in the middle ear. Consequently, any operation that fails to provide adequate drainage of the middle ear is without value.

Still greater mistakes are made in the surgical treatment of this disease entity. Since in these cases the antrum of the mastoid is usually very narrow, it frequently happens that the surgeon fails to open the antrum. All too frequently does one have opportunities to observe patients in whom the antrum was not opened even in the surgical treatment of an acute mastoiditis. It is obvious that such surgical management encourages severe otogenic complications. In the presence of the intracranial complications that ensue, the only operation to be performed is necessarily the complete radical procedure and not the conservative or radical mastoid operation. In addition, as a rule it is necessary to expose at least the lateral sinus, as in many of these complicated cases there is sepsis, frequently associated with lateral sinus phlebitis and even extradural abscess.

ZUSAMMENFASSUNG

Die vorliegende kraeftige Auseinandersetzung richtet sich gegen die Vernachlaessigung chronischer Ohreneiterungen und setzt sich fuer den chirurgischen Eingriff, wo er notwendig ist, ein. Der Verfasser beklagt beilaeufige Aufzeichnungen in den Krankengeschichten wie "Hals, Nasen, Ohren o.B.", die nach seiner Meinung in vielen Faellen ungechtfertigt erscheinen und zu den oben erwaehnten gefaehrlichen Vernachlaessigungen fuehren. Es wird eine bessere elementare Kenntnis der zugrundeliegenden Krankheitsveraenderungen bei verschiedenen Formen von Ohreneiterung gefordert. Die diagnostischen Merkmale des Cholesteatoms werden in folgender Weise aufgezaehlt: 1. Knappe stinkende Absonderung vom Ohr ohne akute Symptome. 2. Im allgemeinen ziemlich leichte Herabsetzung der Hoerfaehigkeit. 3. Schwindel, der zwar vorkommt aber selten sehr ausgepraegt ist. 4. Durchbruch der Shrapnellschen Membran. 5. Leichtgradige Mittelohrtaubheit, die durch Hoerfunktionsproben festgestellt wird. 5. Roentgennachweis.

RÉSUMÉ

L'auteur s'élève contre l'habitude de négliger une suppuration chronique de l'oreille et préconise l'intervention chirurgicale quand elle s'avère d'obligation. Il déplore aussi la façon un peu trop soutenue de cataloguer au dossier par l'expression essentiellemente négative, expression qui, d'après lui, n'est pas justifiée et peut amener des oublis dangereux dans la suite. Le rapporteur insiste pour une meilleure connaissance des changements morbides qui peuvent serencontrer dans différents tyes de suppuration auriculaire. Les principaux signes de cholestéatome sont énumérés- à savoir: lo Un écoulement léger 20 Une diminution relative de l'ouie 30 Du vertige—très peu souvent remarqué, même s'il existe 40 Une perforation de la membrane de Shrapnell 50 Une surdité légère confirmée par l'audiomètre 60 La confirmation par le Rayon-X.

RESUMEN

Se presenta fuerte argumento contra la negligencia en la supuración auricular crónica y en favor de la intervención operatoria cuando es necesaria. El autor deplora la anotación causal "esencial-

mente negativa" en los registros hospitalarios, lo que estima aparece sin justificación en muchos ejemplos y conduce a la peligrosa negligencia mencionada. Se señala un mejor conocimiento básico de los cambios patológicos existentes asociados con diversos tipos de supuración auricular. Los elementos para el diagnóstico de colesteatoma se listan como sigue: (1) descarga fétida escasa del oído sin síntomas agudos; (2) disminución de la audición, generalmente más bien mediana; (3) vértigo, que puede ocurrir y es a menudo marcado; (4) perforación de la membrana de Shrapnell; (5) sordera moderada del oído medio comprobada por las pruebas funcionales para la audición; (6) evidencia röntgen.

RIASSUNTO

Viene fortemente condannata l'abitudell'orecchio, dine di trascurare le suppurazioni croniche le quali viceversa debbono essere senz 'altro operate quand'è necessario.

L'autore deplora gli affrettati cenni solitamente annotati, a proposito di tale organo, sulle cartelle cliniche— che, secondo lui, non solo sono il più delle volte infondati ma portano alla pericolosa negligenza di cui sopra.

Viene pertanto sottolineata la necessità di una miglior conoscenza degli stati patologici che stanno a base dei vari tipi di suppurazione dell'orecchio.

I sintomi caratteristici del colesteatoma sono così elencati: 1—secrezione auricolare scarsa e fetida senza segni di acuzie; 2—ipoacusia, usualmente non troppo accentuata; 3—vertigini, raramente gravi; 4—perforazione della membrana di Shrapnell; 5—modica sordità per alterazioni dell'orecchio medio, secondo le indicazioni dei tests della funzionalità uditiva; 6—alterazioni radiologiche.

SUMÁRIO

Um forte argumento é apresentado contra o descuido da supuração cronica do ouvido e em favor da intervenção operatoria quando necessaria. O autôr deplora a casual inscrição nas observações hospitalares. "Ouvido nariz e garganta essencialmente negativos," o que, em sua opinião, aparece sem justificação em muitas ocasiões e leva ás perigosas negligencias antes mencionadas. Um melhor conhecimento basico das alterações patologicas jubjacentes associadas com varios tipos de supuração otologica é realçado. O quadro sintomatico de colesteatoma é alinhado a seguir:

1. Escásso, fetido corrimento do ouvido sem sintomas aguidos. 2. Diminuição da audição, usualmente muito ligeira. 3 Tonteira a qual pode ocorrer mas é raramente intensa. 4. Perfuração da membrana de Shrapnell. 5. Ligeira surdêz do ouvido medico revelada pelos testes funcionais de audição. 6. Evidencia radiologica.

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The Maxillofacial Triad and Its Correction, with Special Reference to the Nasal Septum

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THE term "maxillofacial triad" is proposed to designate a facial deformity resulting from nasal trauma in early childhood, which presents characteristic and interrelated features. The nose is crooked, with marked posterior deviation of the septum, which is usually dislocated caudally, causing a twisted lip and columella; the palate is high and arched; and the chin recedes, in advanced cases frequently giving the appearance commonly referred to as "bird face" (Fig. 1).

Although one would be inclined to think it common knowledge that obstructive deviations in children create facial disfigurements in adolescence, I have encountered many persons who did not know it. The influence of nasal obstruction due to enlarged adenoids in facial and palatal development was known, but the similar influence of nasal obstruction in childhood due to injured noses and septums was not.

My attention was further focused on this significant deformity in the course of taking histories for patients desiring rhinoplasty. It became evident that a large number of rhinoplastic procedures could have been avoided if injuries of the nasal septum and the nasal bones had been adequately handled at the time they occurred. It was noteworthy that many patients distinctly remembered nasal traumas occurring at 5, 6 or 7.

It is for this reason that the present paper is offered. The term "maxillofacial triad" may serve a purpose in making the physician aware of the sequelae of nasal injuries untreated in childhood. Elucidation of this syndrome may prevent overlooking these conditions and permit nasal injuries in the young to be treated promptly.

Etiologic and Pathogenic Data.—The harmonious skeletal development of the face is an effect of the opposing and balancing action of two sets of muscles. The action of the external face muscles, which because of their tone tend to lengthen the facial skelton, is counteracted by that of the muscles of the tongue, which tend to spread the facial structures laterally. Alteration in this harmonious development caused by nasal obstruction due to a badly deflected septum incurred during development results in the maxillofacial triad.

A marked septal deflection will cause mouth breathing, and, as the open mouth interferes with the forward and lateral expanding pressure of the tongue, the unopposed action of the facial muscles causes the normal flat arch of the palate to assume a Gothic shape. This in turn results in dental distortion, misplacement and irregularity of the teeth, malocclusion and overbite. The muscular disharmony is not limited to the palate but occurs also in the mandibular muscles, and may result in microgenia or micrognathia.

The history in each instance of such maldevelopment is characteristic. Early in life the nose is injured; the injury is followed by nasal obstruction and deflection of the nose. No attempt is made to reset the displaced parts. As the child grows and approaches adolescence the development of the face is accelerated, and the external and intranasal deformities and retrusion of the lower jaw become more noticeable. The features usually due to nasal obstruction and resultant mouth breathing become apparent. The upper lip is retracted upward: the alveolar margins, instead of being shaped like a horseshoe, take on a hairpin curve, and the face assumes a stupid, languid expression (Fig. 2).

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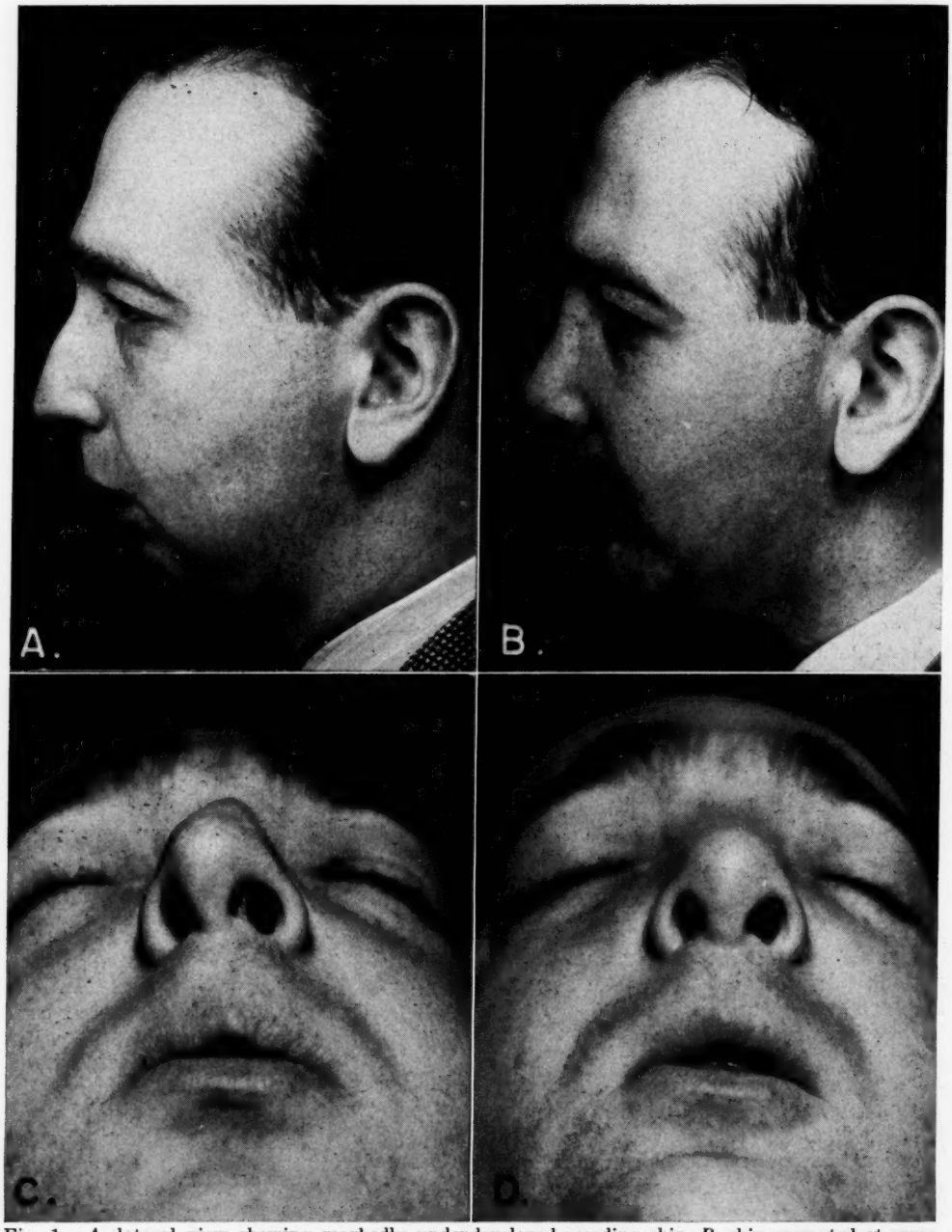

Fig. 1.—*A*, lateral view showing markedly underdeveloped receding chin. *B*, chin corrected at same time rhinoplasty was done. *C*, basal view showing twisted tip and columella. Note caudal dislocation of septum which occluded left nostril. *D*, improved nasal physiologic results of plastic correction.

It must be recognized that, from the moment of the very first respiration at birth, one of the most potent influences on the expansion and development of the

jaw is the physiologic action of correct respiration. Nasal and septal injuries are prone to follow obstetrical delivery with or without use of forceps. It is advisable, therefore, that soon after birth the position of the septum be ascertained. If the septum has been dislocated from the crest or vomer, it should be realigned.

Fractures of the nasal bones and deflections of the septum in infancy and childhood should be reduced at once. This will prevent future disfigurements. The septum can be repositioned and reconstructed, and the nasal bones can be reset. If such conditions are left untreated, the resulting nasal physiologic disturbance not only causes the aforementioned maxillofacial disfigurements but may cause disturbance of thoracic architecture and so increase the tendency to pulmonary infections. In addition, it predisposes the sinuses and ears to infection and undermines the general well-being of the patient.

Management of Deformed Components.—Obviously, the prophylactic treatment is of greatest importance. Once the deformity has developed, the best that can be offered is some restorative work for the chin. Cartilage, bone implants, or (frequently) material left over from the reconstruction of the nose may be utilized for building up the chin.

The palatal defect must be left to the orthodontist, who, by placing stresses on various teeth, may alter the shape of the palate if it is not seen too late in facial skeletal development. Nasal reconstruction will eliminate the other element of the triad.

The micrognathia can be corrected by a number of methods. The patient's hump or the hump superimposed with several layers of septal cartilage to give increased

Fig. 2.—H. P., aged 7. Nose injured two years previously but no attempt made to correct deformity. Examination showed crooked nose and badly deflected septum causing nasal obstruction. Anterior and lateral views are presented. Note crooked nose, open mouth and languid expression.

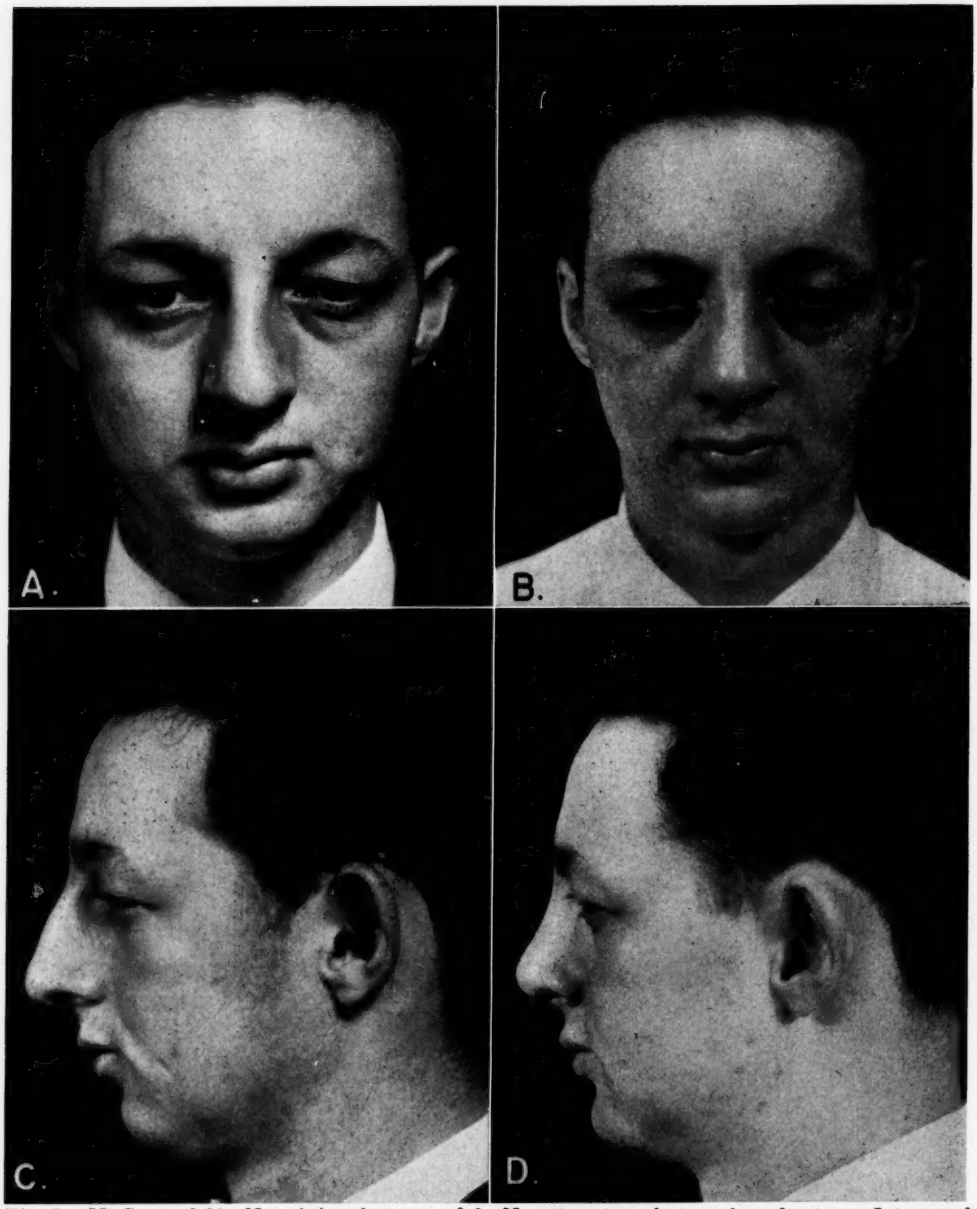

Fig. 3.—M. C., aged 21. Nose injured at age of 6. No attempt made to reduce fracture. Intranasal examination showed septum deviated to right posteriorly and angulated to left anteriorly, blocking entrance of air to both right and left nasal chambers. *A*, anterior view, showing crooked nose. *B*, results of simultaneous submucous resection and rhinoplasty. *C*, lateral view, showing microgenia. *D*, defect corrected by submental insertion of patient's hump.

bulk, rib cartilage or cancellous iliac bone grafts can be inserted through a submental, mental or oral vestibular incision to build up the chin between the mandible and the soft tissue. Not only should the chin be provided with sufficient anterior

projection, but it should be so constructed that it blends laterally with the angle of the jaw (Figs. 3, 4, 5 and 6).

Within recent years the literature on the septum operation has been replete with new procedures and extensive bibliographic data. The variety of procedures and the strategic technics to be employed in individual cases have added to the complexities of management. For several years I have employed a uniformly simple technic, especially for caudal displacements, off-center central and C-shaped or S-shaped ventral deformities, with or without rhinoplasty, which has served me satisfactorily and has not involved retraction of the columella or loss of stability of the nasal dorsum. Obviously, no method is without its hazards, and one must be prepared to handle them should they arise; e.g., a nose with markedly crooked nasal bones and an extremely crooked cartilaginous dorsum is sometimes corrected by sacrificing these elements and replacing them with a graft. To all intents and purposes the technic to be described will suffice for the vast majority of deviated septums with caudal and ventral deformities; it utilizes the rhinoplastic approach with or without accompanying correction of the nasal framework.

Operative Technic.—The operation is performed with the patient supine. The nose is prepared, cleansed and anesthetized.

1. *Technic of Submucous Resection Without Rhinoplasty:* A small vertical incision is made in the lower quarter of the right side of the columella while it is being retracted to the opposite side. The incision is made as close to the septum as possible (Fig. 7*A*). If the columella is broad it can be thinned at this time by removing intercolumellar tissue with a Stevens scissors (Fig. 7*B*). A No. O black silk or a No. 4-0 chromic catgut mattress suture on a straight needle is then passed through the columella to the opposite side and is returned to the right side. Another piece of black silk or No. 4-0 chromic catgut is put through the loop on the opposite side of the columella, and both sutures are

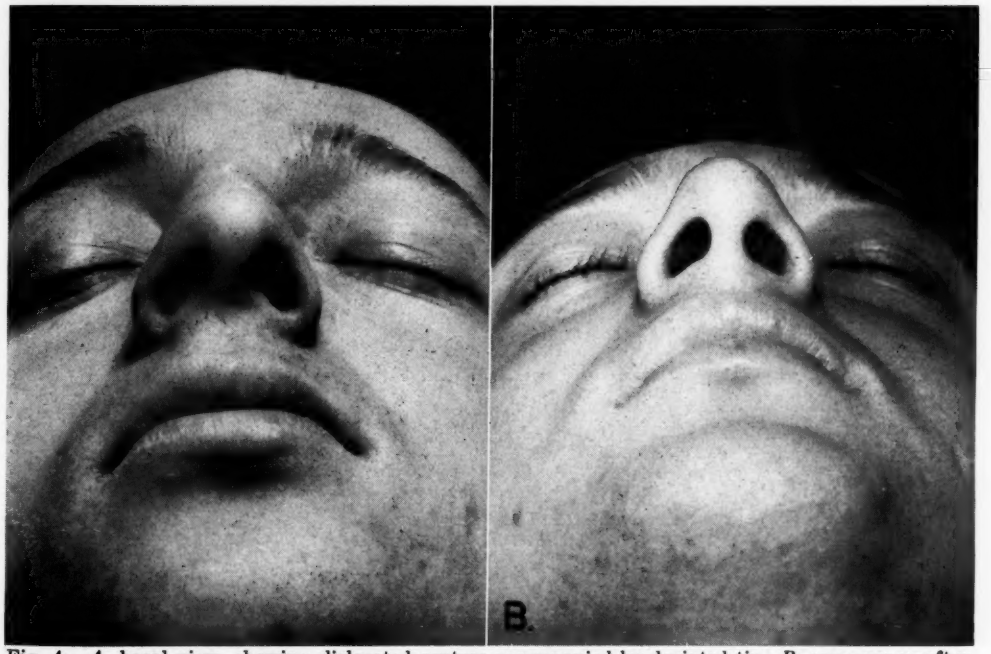

Fig. 4.—*A*, basal view, showing dislocated septum accompanied by deviated tip. *B*, appearance after correction.

Fig. 5.—T. I., aged 35. Nose injured in early childhood, difficulty in breathing since that time. Intranasal examination showed septum deviated to right posteriorly and presenting in left nostril caudally. Teeth were irregular and palate was high and arched. *A*, anterior view, showing nasal deformity. *B*, result of simultaneous submucous resection and rhinoplasty. Papilloma on forehead was also removed. *C*, lateral view, showing moderately receding chin. *D*, chin corrected at same time as rhinoplasty.

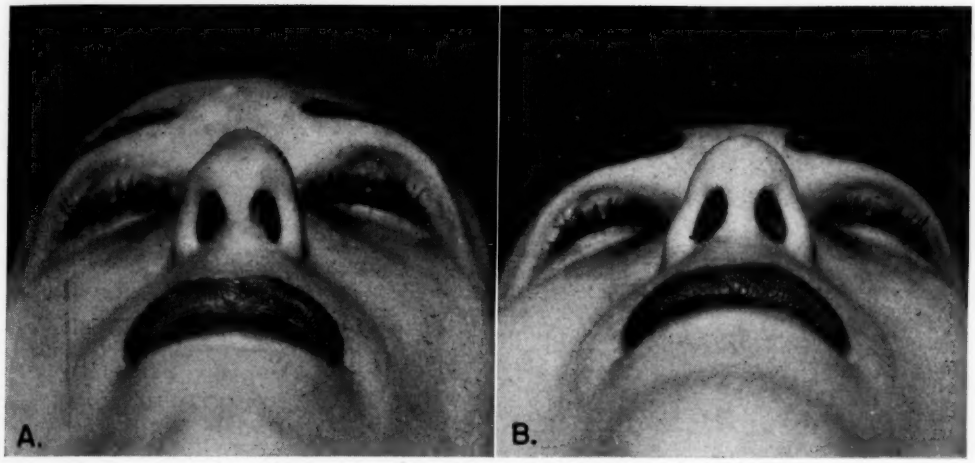

Fig. 6.—*A*, basal view, showing caudal dislocation of septum. *B*, correction of septum, with improved nasal breathing.

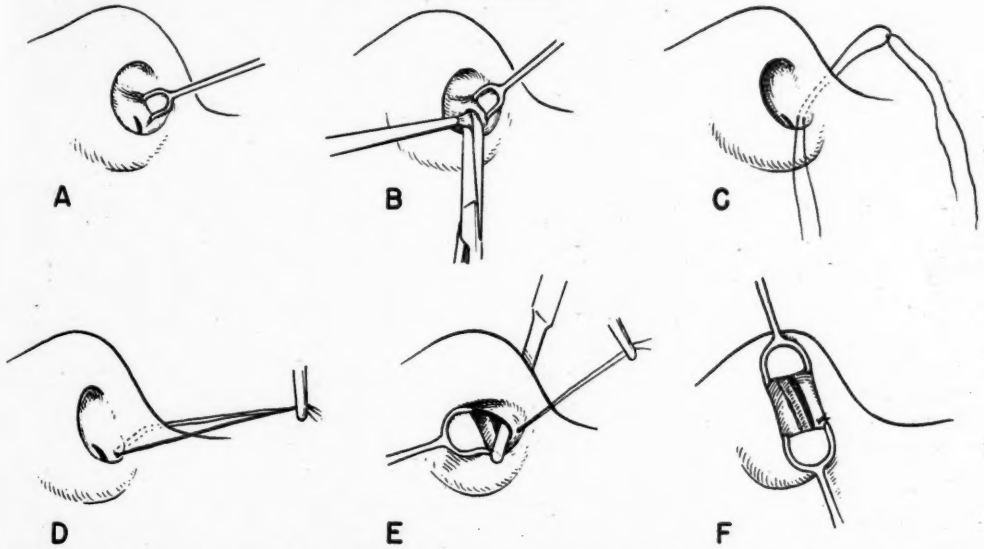

Fig. 7.—*A*, incision low on right side of membranous septum, which has been exposed by pulling on columella with small sharp two-pronged retractor toward left side. *B*, removal of intercolumellar subcutaneous tissue. *C*, insertion of mattress suture used for fixing columella. Loop of thread on opposite side of incision to be used for traction when membranous septum is transfixed. *D*, hemostat at end of suture, which is long enough to reach chin. *E*, traction to avoid sacrifice of any part of membranous septum. *F*, columellar suture cut about ¼ inch (0.6 cm.) beyond knots. Caudal margin of septum exposed.

tied (Fig. 7*C*). The ends of the sutures are left long enough to reach below the chin, where they are grasped by an artery clamp (Fig. 7*D*). The septum is then transfixed, and as the button knife frees the septal mucosa from the columella the assistant makes traction on the previously inserted columellar sutures (Fig. 7*E*). By this maneuver none of the membranous septum is sacrificed, no matter how distorted is the septal margin. After the transfixion the original columellar sutures

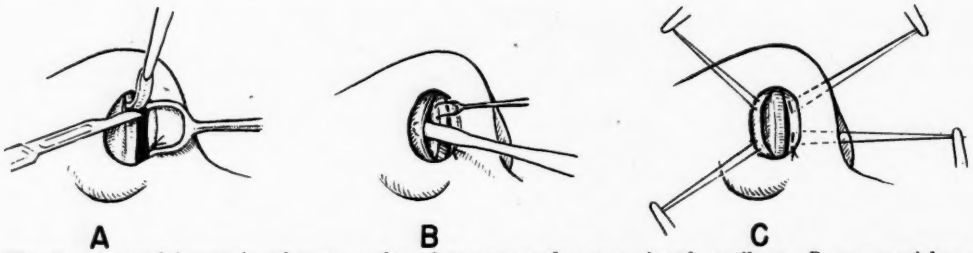

Fig. 8.—*A*, caudal margin of septum shaved to expose free margin of cartilage. *B*, mucoperichondrium freed on both sides for short distance. Small two-pronged retractor pulls septum to steady it and aid separation of mucoperichondrium. *C*, black silk sutures inserted through mucoperichondrium to serve as guides and retractors.

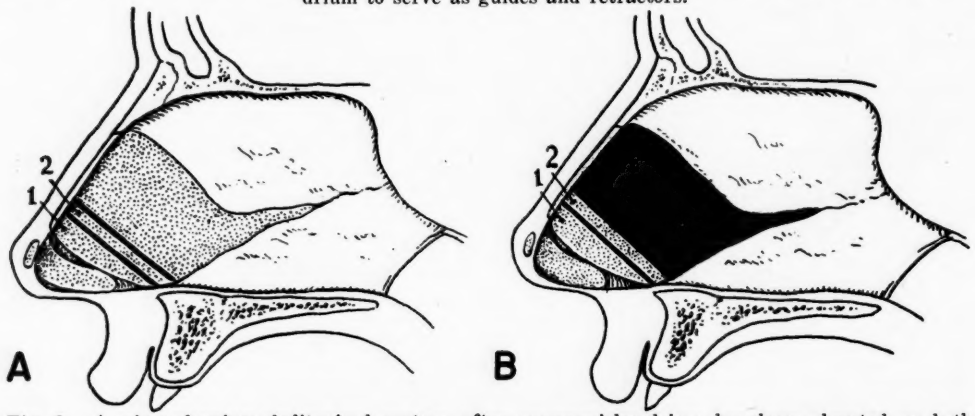

Fig. 9.—*A*, view showing skelitonized septum after mucoperichondrium has been elevated on both sides. Correction of deformity is carried out by making first vertical incision ¼ inch (0.6 cm.) beyond the transfixion, producing segment 1; second parallel incision is made about ¼ inch (0.6 cm.) posteriorly, producing another freely movable segment (segment 2), which acts as a buttress to segment 1. *B*, blades of a Killian speculum are inserted posteriorly to segment 2, permitting visualization of septum for removal of desired cartilaginous and osseous septum.

are cut about ¼ of an inch (0.6 cm.) beyond the knots. This, in my opinion, aids in fixing the columella, thus helping to prevent retraction, thinning out the structure and straightening the distortion (Fig 7*F*).

One now visualizes the caudal margin of the septum covered with tissue, which may be thick or thin depending on the degree or type of trauma which contributed to its deviation or dislocation. The redundant tissue is shaved down to include the outermost layer of the septum; this exposes the edge of the cartilage (Fig. 8*A*). The septal mucoperichondrium on both sides is now freed for a short distance (Fig. 8*B*). Two fine black silk sutures are inserted on either side, dorsally and ventrally, to serve as retractors and guides which will exert traction on the mucosa when it is to be resutured to the bare septum (Fig. 8*C*). The septal mucosa is now elevated on both sides as high up, as far back and as low down as necessary. The freeing is important not only for visualization of the septum to be resected but for equalization of the length of the mucosa. In this type of septal deformity the convex side of the mucosa, being short, will tend to curl or twist the residual cartilage when healing takes place, so that unless the mucous membranes are equalized a kink of the mucosa left behind may slowly pull and shift the cartilage into its previously dislocated position, thus defeating the purpose of the operation. Through the left nostril an incision is made in the septum about

¼ to ⅜ inch (0.6 to 0.9 cm.) beyond the transfixion, which I call segment 1 (Fig. 9*A*). The incision is made as long vertically as is necessary, depending on the extent of the deformity. The next incision in the cartilage is made about ¼ inch (0.6 cm.) or less beyond the first and parallel to it, forming segment 2. The length of the incision depends on the deformity, but the incision can be made as high as necessary and extend downward as low as required. The blades of a Killian speculum are then inserted between the flaps beyond the second vertical incision, exposing the remaining quadrilateral cartilage, perpendicular plate or vomer to be removed, depending on the requirement of the operation (Fig. 9*B*). The second segment, i. e., the strip of cartilage posterior to the first vertical incision, is now inspected. If it is deviated or twisted it can be corrected, as it is free and pliable. It can be straightened or partially resected, but it is important not to remove the extreme central extension where it is confluent with the upper lateral cartilages. It is unnecessary to do so at all events, as management of the dorsal portion by excision of latticing and the suspension from the upper lateral cartilages straightens the mobilized ventral fragment. This is sufficient to act as a pillar for the first vertical compartment, or segment 1, which abuts against it, and is also adequate in maintaining protective continuity against saddling.

Attention is next directed to the deviated spine and maxillary crest. Unless they are corrected by partial resection, removal or realignment by fracturing and shifting to the midline, the loose, pliable caudal portion of the septum will not maintain its corrected position. The septum must be devoid of deflecting elements at the spine or the maxillary crest; otherwise the loose septum healing on the crooked base will again twist and cause nasal obstruction.

The pilot sutures are then brought forward, and No. 4-0 chromic catgut sutures on double-armed straight needles are inserted through the septal mucosa, trapping the septal segments (Fig 10*A*). The sutures are inserted ventrally and dorsally, and the septum can be seen positioned between the septal membranes in a sandwich-like fashion. Should this segment still show evidence of buckling, this can be eliminated by making one or more horizontal or oblique incisions on the septum between the attached mucoperichondrial flaps.

The straight caudal septal margin, easily movable in any direction, is readily attached to the columella with black silk sutures supplemented by several fine black silk sutures from the septal mucosa to the columella (Fig. 10*B*).

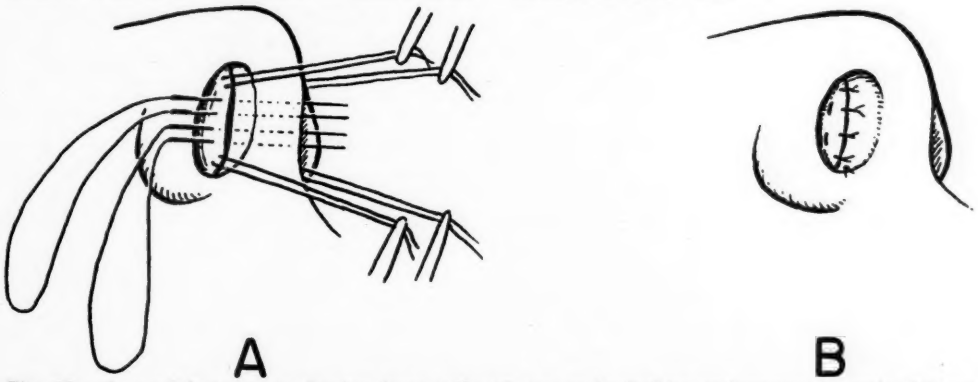

Fig. 10.—*A*, caudal segments, having been tailored, are reattached by replacement between the two layers of mucoperichondrium held taut by black silk sutures. Two double-armed chromic catgut sutures on straight needles are inserted through the two layers of perichondrium, trapping and fixing the septal segments (segments 1 and 2). *B*, supplementary interrupted fine black silk sutures approximating mucoperichondrial flaps to free margins of columella.

When this has been completed it may be observed that, although the septum is in the corrected and desired position, the mucoperichondrium of the floor of the nose pulls on the septal mucosa. As traction in time would cause torsion, it is necessary to incise the septal mucosa horizontally at the junction with the floor of the nose. The raw area is covered with a piece of intranasal mucous membrane, pieces of removed lower lateral cartilage, or vestibular skin to prevent scar contraction. The free graft takes readily, and the floor of the nose heals rapidly.

A piece of paraffin mesh about 2½ inches (6.2 cm.) long and ¾ inch (1.9 cm.) wide is inserted along both sides of the septum down to the floor of the nose. The nose is packed with petroleum gauze, which is left in place for four days. The sutures are removed seven days after the operation. The reaction is usually minimal. Slight thickening of the caudal region may be noted for the first few weeks, but there is immediate relief from nasal obstruction.

If the septum has been of the thickened fibrotic type associated with hypertrophic mucous membranes there is apt to be persistence of the thickening of the caudal region, but this in no way interferes with the airway. Inspection will show two adequate passages in both nostrils.

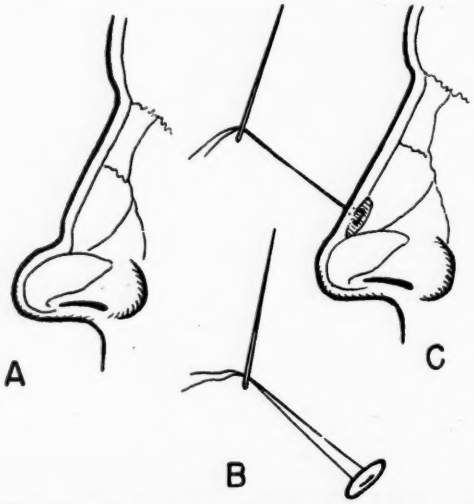

Fig. 11.—*A*, depression between lower third of nasal dorsum and tip over weak triangle. *B*, circular septal transplant or superimposed pieces of lower lateral cartilage on guide suture. *C*, guide suture passing through depressed area, placing attached cartilage in precise region to elevate dorsum.

2. *Technic of Submucous Resection with Rhinoplasty:* The nose is undermined and the soft parts of the bony and cartilaginous dorsum are elevated; this is followed by transfixion through the membranous septum. If a hump is present it is removed. If not, the spring of the bony arch is broken and the profile projection is properly aligned. The septum is shortened if necessary. Occasionally this may remove the caudal dislocation, but such an event is rather infrequent, as the injury causing this type of deflection usually occurs at an early age, and as the caudal twist grows laterally it is not associated with an extending septum. The desired length of the septum having been ascertained, the next step is correction of the deviated septum, which is carried out as previously described.

Up to this point the caudal portions of the upper lateral cartilages have not been cut from the septum. The cephalic attachments, however, have been cut, either in removal of the hump or in breaking of the spring of the bony arch (usually with the chisel) when no hump is present. Hence there is always some separation of the upper lateral cartilages from the septum. If they are twisted, as in the case of C-shaped or S-shaped deformities of the ventral margin, they are cut from above downward to free them from the septum, but one does not cut through the mucosa and mucoperichondrium. They are elevated and freed on the ventral surfaces, and the ventral curves or irregularities are removed. The cartilages are also equalized, since one side is frequently longer and broader than the other. Despite the trimming of the ventral surface the upper lateral cartilages may in some cases maintain a fine sinuous border, but this will not prevent the formation of a straight dorsum.

The stabilizing effect of the upper lat-

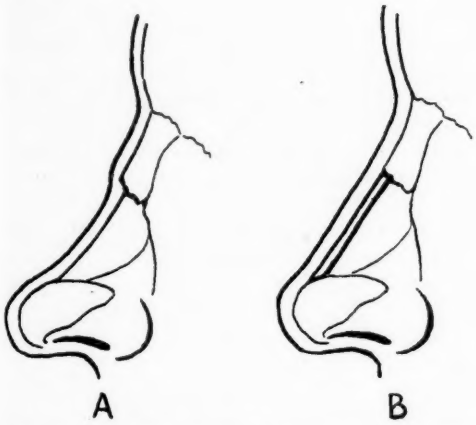

Fig. 12.—*A*, depression of entire cartilaginous dorsum. *B*, depression corrected by insertion of septal transplant extending from tip to nasal bones. Accurate approximation of graft to nasal bones can be facilitated by passing guide suture through cephalic end of the graft, suture emerging in nasofrontal region.

eral cartilages, which are part of the septum, depends a good deal on their intrinsic tensile character. Some are flabby and depressed, exerting very little effect. Others are strong and maintain a firm dorsum, not requiring the contributing support of the septum.

After the upper lateral cartilages have been trimmed or equalized, the osteotomy is performed. If the septal resection has included the perpendicular plate of the ethmoid and a large part of the vomer, it is obvious that twisting and pushing the nasal bones and their contiguous nasal processes may be followed by loss of stability, and the bones will drop down toward the nasal cavity, pulling the upper lateral cartilages with them and causing saddling not only of the bony but of the cartilaginous portion of the dorsum. Under these circumstances especially, the nose is first packed with petroleum gauze before the nasal processes are shifted mesially. Once the nasal bones have been aligned after the osteotomy it is a good principle not to manipulate them too vigorously.

3. *Management of the Dorsum in Rhinoplasty with Submucous Resection:* Despite the fact that a technically perfect operation has been performed, it may be apparent that the dorsum is not aligned, the bones are not exactly in the midline or there is a deviation of the ventral margin from its central position. Further manipulation to straighten the nose may result in a loss of stability of the dorsum. There is obvious sagging which calls for immediate correction. The sites of the depressions are as follows:

(a) *At the weak spot of the cartilaginous dorsum;* e. g., at the point at which the caudal portions of the upper lateral cartilages are attached to the septum. In this area the septum is practically beneath the skin as it is uncovered by the upper lateral cartilage, especially in instances in which the upper lateral cartilages are short or are attached more cephalad, or the aponeurosis to the lower lateral cartilages is frail or atrophic. If a depression becomes obvious in this region, a circular piece of septum or several pieces of excised lower lateral cartilage, properly sized, can be inserted and will often fit perfectly. These can be accurately placed by the use of a pilot suture emerging through the skin at the precise area of depression (Fig. 11, *A*, *B*, and *C*).

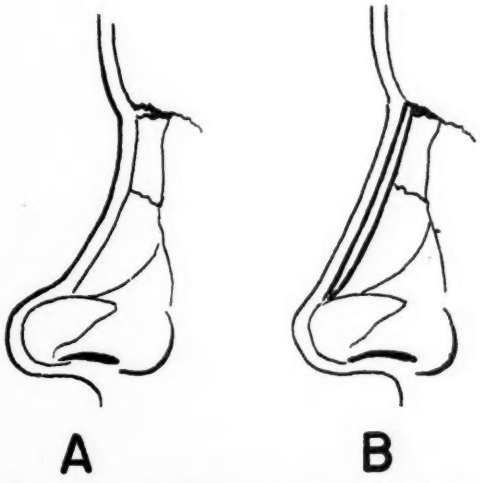

Fig. 13.—*A*, depression of osteocartilaginous dorsum. *B*, depression corrected by insertion of removed septal transplant if long enough. If not, combination (see Figures 9 *B* and 10 *B*) may be adequate. Cancellous iliac bone graft most desirable if sufficient material is unavailable for repair.

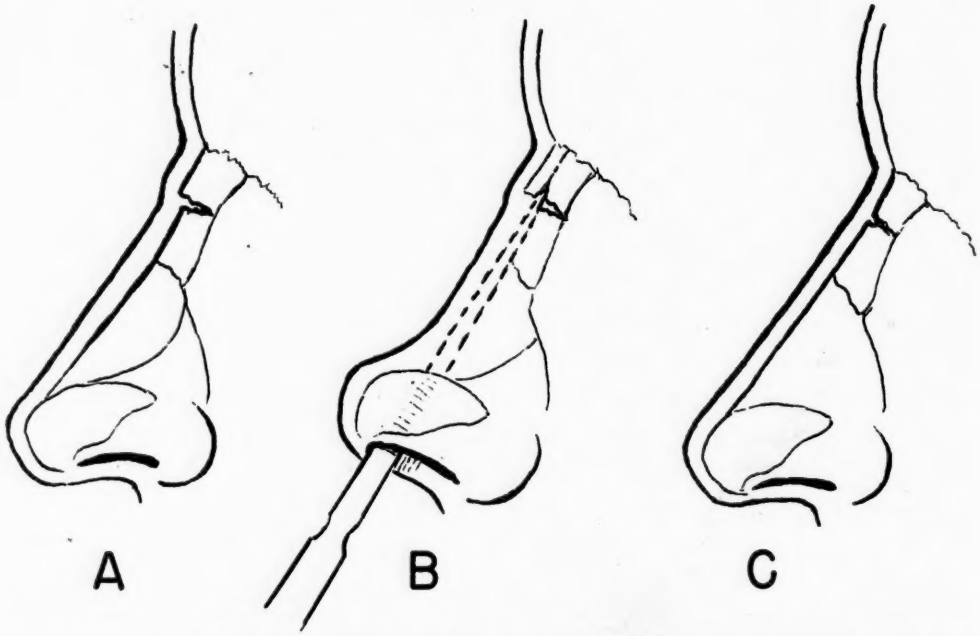

Fig. 14.—*A*, osteocartilaginous depression with persistence of high hump due to elevated nasofrontal angle. *B*, bone removed with chisel. *C*, profile projection now in proper alignment; no transplant necessary.

(b) *Along the entire cartilaginous dorsum.* The upper lateral cartilages may be so deviated and distorted that after reduction in size they furnish no support to the dorsum and lower its projection; or the upper lateral cartilage may be so short or frail that after manipulation and shifting they lose their stability and sag, producing a saddle when their septal component has been removed. Dorsal continuity is accomplished by insertion of a narrow septal graft extending from the nasal tip to the lower margin of the nasal bones. This graft may also be piloted by a suture, which emerges at the nasofrontal region. If the depression is inadequately camouflaged by one layer of septum, two layers can be superimposed (Fig. 12, *A* and *B*).

(c) *Along the entire bony and cartilaginous dorsum.* On medial displacement after osteotomy the entire dorsum seems to fall into the nose because of complete loss of support of cartilaginous and bony elements. The removed septal cartilage may be long enough to extend along the entire dorsum. Although it is not advisable to use multiple grafts in the dorsum, if there are several pieces and one is rather long the latter is inserted toward the glabella, and the depression of the caudal margin of the upper lateral cartilages can be accurately filled with a second circular septal graft placed in the desired position (Fig. 13, *A* and *B*).

(d) *Depression of the cartilaginous and bony dorsum with persistence of a high frontal angle.* After the pyramid has been shifted it becomes obvious that the nasal bones and cartilages have dropped several degrees, resulting in a dorsum with a profile line which would meet esthetic approval were it not for a cephalic eminence. This occurs at the radix and is easily removed with a chisel, so that the entire profile from tip to nasion is aligned in harmonious relationship (Fig. 14, *A*, *B*, and *C*).

SUMMARY

Triple facial deformities involving the nose, palate and chin and resulting from nasal trauma early in childhood, for which the term "maxillofacial triad" is proposed, can be corrected by a single operation. In addition to facial maldevelopment, orthodontic problems can be obviated by early examinations and immediate care in cases of nasal or septal injury. A method is described of dealing with caudal and ventral deformities of the septum without hazard of retraction of the columella or saddling of the nasal dorsum. The distorted or dislocated caudal cartilage, having been made freely movable and supported by a posterior buttress, is reattached between the two layers of the membranous septum and then reunited to the mesial crura in the proper anatomic position.

SUMÁRIO

Deformidades faciais triplices interessando o nariz, palato e queixo podem resultar de trauma precóce da infancia, pelo que o termo "Triade maxilo-facial" é propôsto. Adicionalmente á correção do máu desenvolvimento facial, problemas orthodonticos podem ser evidados por exame precoce e atenção imediata aos traumas nasais ou septais. O metodo de tratar deformidades caudais ou ventrais do septo sem perigo de retração da columéla ou ensilhamento do dôrso nasal é descrito. A cartilagem caudal distorcida ou deslocada tendo sido liberada livremente e suportada por um contrafórte posterior é ligada novamente entre as duas camadas de septo membranôso e então reunida ao crura interno em posição anatomica adequada.

RÉSUMÉ

Un traumatisme en bas âge sur le nez peut amener des déformations au nez, au palais et au menton en même temps. La correction faciale mise à part, les problèmes d'orthodontie peuvent être réglés par l'examen précoce et le traitement immédiat du nez ou du septum. L'auteur décrit sa méthode de réparer la partie caudale ou entrale du septum sans craintes d'avoir une rétraction de la lamelle ou une déformation en selle de la partie dorsale du nez. Le cartilage caudal tordu ou disloqué est libéré et rendu mobile par l'intervention d'un support postérieur et replacé en position anatomique entre deux bandes de la muqueuse du septum.

ZUSAMMENFASSUNG

Eine dreifache die Nase, den Gaumen und das Kinn einbeziehende Entstellung des Gesichtes kann die Folge einer im Kindesalter erlittenen Nasenverletzung sein. Fuer diese Missbildung wird die Bezeichnung "maxillofaziale Trias" vorgeschlagen. Ausser der Korrektur von Gesichtsmissbildungen kann eine rechtzeitige Utersuchung und die unverzuegliche Behandlung von Verletzungen der Nase oder des Septums das Auftreten orthodontischer Probleme verhueten. Es wird eine Methode beschrieben, kaudale und ventrale Entstellungen des Septums ohne Gefahr einer Verkuerzung der Columnella oder einer Sattelbildung des Nasenrueckens zu behandeln. Der verschobene oder verrenkte kaudale Knorpel wird erst frei beweglich gemacht und durch einen hinteren Strebepfeiler gestuetzt, dann zwischen den beiden Lagen der membranoesen Scheidewand wieder befestigt und schliesslich mit den medialen Schenkeln in der richtigen anatomischen Stellung wieder vereinigt.

RIASSUNTO

Le deformità facciali interessanti il naso, il palato e il mento possono derivare da un trauma del naso riportato nelle prima infanzia; per esse viene proposta la denominazione di "triade maxillofacciale."

Oltre alla correzione della malformazione facciale, è necessario far subito attenzione alle deformità delle mascelle e del naso (ossa e setto) per poter ovviare ai problemi d'ortodonzia.

Viene descritto un metodo di cura delle deformità delle por zioni caudale e ven-

trale del setto; con tale metodo non v'è pericolo di retrazione del margine inferiore del setto o d'insellamento del dorso del naso. La porzione caudale della cartilagine del setto, deviata o dislocata, viene liberata e rinforzata da un sostegno posteriore, e poi riunita ai due piani del setto membranoso e alle branche mediali delle cartilagini alari, nella sua corretta posizione anatomica.

RESUMEN

Se propone el término "tríada maxilofacial" para las deformidades faciales triples, nasales, palatinas y mentonianas que pueden resultar del trauma nasal temprano en la infancia. Además de corregirse el desarrollo facial defectuoso, pueden obviarse problemas ortodóncicos con el examen temprano y la atención inmediata de las lesiones nasales o del tabique. Se describe un método de tratamiento para deformidades caudales o ventrales del tabique, sin peligro de retracción del cartílago o ensillamiento del dorso nasal. Movilizándolo convenientemente y con sostén posterior, el cartílago caudal dislocado o desviado se fija nuevamente entre los dos planos del tabique membranoso, reuniéndolo por consiguiente al cruce mesial en la posición anatómica adecuada.

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The Effects of Surgery of the Inferior Oblique Muscle on Lateral Deviation

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THE oblique extraocular muscles are generally grouped with the superior and inferior recti, and together they are regarded as the "vertically acting" muscles. It is well known, however, that the primary action of the oblique muscles is torsion, since most of their energy is expended around the anterior-posterior diameter of the globe. Because they also act around the horizontal and vertical axes, the oblique muscles have, as their subsidiary functions, rotation of the globe in both the vertical and the horizontal direction.

The action* of the inferior oblique muscle is generally regarded as primarily extorsion, and secondarily elevation and external rotation or abduction (Fig. 1*b*). Elevation is believed to be at a maximum, and extorsion and external rotation at a minimum, when the globe is internally rotated or adducted. In this position the pull of the muscle is supposed to be at right angles to the transverse diameter and parallel to the anterior-posterior diameter of the globe (Fig. 1*c*). Elevation is thought to be at a minimum and extorsion and external rotation at a maximum when the globe is turned outward or abducted, in which position the muscle is supposed to be parallel to the transverse diameter and at right angles to the anterior-posterior diameter of the globe (Fig. 1*a*). This is the usually accepted explanation of the action of the inferior oblique muscle. There is, however, another version of the subsidiary action of the muscle, as will be shown later.

From the Graduate School of Medicine, University of Pennsylvania.
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*The globe is never rotated by a single muscle, but rather as the result of contraction and relaxation of a group of agonists and antagonists. By action of a muscle is meant the directions in which energy of the muscle is expended for any particular position of the globe.

The inferior oblique muscle arises just inside the rim of the inferior mesial angle of the orbit and passes upward as well as posteriorly and laterally to insert under the external rectus and near the horizontal equator on the posterior lateral aspect of the globe. These exact anatomic positions have been worked out by Volkmann[1] and others, and confirmed most recently by Fink.[2] The muscle makes an angle of about 51 degrees with the anterior-posterior diameter of the globe when the eye is in the primary position. I have shown[3] that the pull of the muscle as well as the muscle plane will pass anterior to the vertical axis of the globe (Fig. 2*c*). In the primary position, therefore, the inferior oblique muscle will act as an internal rotator or adductor. This subsidiary function increases in amount as the eye is rotated inward (Fig 2*d*) and the line of pull is located more anteriorly to the vertical axis. Conversely, as the eye is rotated outward or abducted very slightly (about 6 degrees), the pull of the muscle is directly through the vertical axis of rotation and no lateral rotation is effected (Fig. 2*b*). Then, as the eye is rotated outward or abducted still further, the pull of the muscle passes posterior to the vertical axis and the muscle acts as an external rotator or abductor; this subsidiary function increases as the eye continues to rotate outward and the pull of the muscle is located more posteriorly (Fig. 2*a*).

In short, then, the horizontal, subsidiary action of the inferior oblique muscle can work in two directions: When the eye is internally rotated, the muscle functions as an internal rotator or adductor, this function increasing as the eye is turned inward still further; when the eye is externally rotated, the muscle

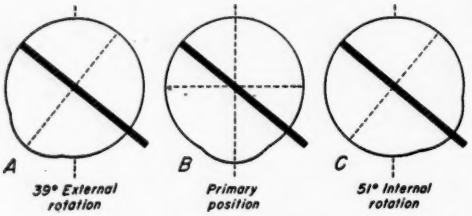

Fig. 1.—Usually accepted position of inferior oblique muscle, right eye.

functions as an external rotator or abductor, and this function increases as the eye is turned outward still further. This statement of the subsidiary action of the inferior oblique muscle differs from the generally accepted action mentioned above, but is based on the work of Volkmann,[1] Fick,[4] and Wilson,[5] and has been attested to by many others, including Verrijp[6] and Van der Hoeve,[7] and demonstrated mathematically by Krewson.[8]

The fact that the inferior oblique muscle has a horizontal action can be especially important in cases of strabismus combining a vertical and a horizontal element. The inferior oblique muscle may overact or underact and both disturbances are encountered, with either convergent or divergent deviation.

Oculomotor conditions in which the inferior oblique muscle is overactive, have been classified by Loutfallah.[9] Some of these are as follows: 1. Weakness of the contralateral superior rectus (yoke) muscle. 2. Weakness of the homolateral superior oblique muscle (direct antagonist). 3. Weakness or fibrosis of the homolateral external rectus muscle. 4. Primary or secondary spasm of the inferior oblique muscle. Most of these may be unilateral or bilateral, and usually exohypertropia prevails, although esohypertropia may be encountered.

When the horizontal element of a combined vertical and horizontal squint is convergent (esohypertropia), the overacting inferior oblique muscle, for the reasons aforementioned, acts as an internal rotator or adductor (Fig. 2*d*) and helps to turn the eye still further inward. Conversely, when the horizontal element is divergent (exohypertropia) the inferior oblique muscle acts as an external rotator or abductor (Fig. 2*a*) and aids in turning the eye outward all the more.

The surgical treatment of choice under these conditions is to reduce the overaction of the inferior oblique muscle, either by a recession or a myectomy at the scleral insertion of the muscle or by some lengthening procedure at the point of orbital origin. This will reduce the elevating effect of the overacting muscle. Also, it will minimize the internal rotating or adducting effect if the eye is convergent, and reduce the external rotating or abducing effect if the eye is divergent. Thus, weakening of an overactive inferior oblique muscle will tend to correct primarily the vertical deviation and secondarily (and to a lesser extent) the accompanying convergent *or* divergent deviation.

Underaction of the inferior oblique muscle may be associated with paresis of other ocular muscles, especially the superior rectus and the levator, or it may occur as an isolated lesion of congenital or traumatic causation. Under such circumstances it is unilateral, and hypotropia with exodeviation is common, although esodeviations are sometimes encountered.

When the horizontal element of a combined squint is divergent (exohypotropia), the underactive inferior oblique muscle, for the reasons mentioned, allows the eye to be deviated outward still more (Fig. 2*a*). Conversely, when the horizontal effect is convergent (esohypotropia), the underactive inferior oblique muscle, for the reasons mentioned, is in such a position as to act as an internal rotator (Fig. 2*d*).

Surgical intervention to correct an underactive inferior oblique muscle may involve resection, advancement or tucking of the muscle at its scleral insertion, or some form of strengthening operation at the orbital origin. This will tend to lessen the hypotropia due to the underactivity of the muscle. Also, it will increase the external rotating or abducting power if the eye is divergent, and will augment

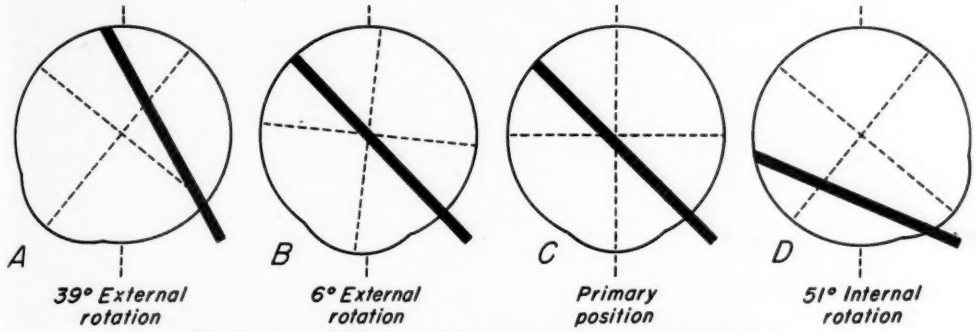

Fig. 2.—Actual position of inferior oblique muscle, right eye.

the internal rotating or adducting power of the eye if the eye is convergent. Thus, strengthening of an underacting muscle acts primarily to correct the vertical deviation, but it also will secondarily (and to a lesser extent) augment or increase the accompanying divergent *or* convergent deviation.

Therefore, when a vertical and a horizontal deviation occur simultaneously and the condition involves the inferior oblique muscle, the horizontal function of the muscle is of special importance. Nonrecognition of the true action of the muscle may result in errors of diagnosis and in unexpected surgical failure.

SUMMARY

1. The action of the inferior oblique muscle is discussed. The primary action is extorsion, which increases in outward rotation or abduction. The subsidiary actions are elevation, which increases on inward rotation or adduction, and both internal rotation or adduction and external rotation or abduction, depending on the position of the globe; internal rotation prevails when the eye is internally rotated, and external rotation occurs when the eye is externally rotated.

2. Clinically, the inferior oblique muscle may be overactive or underactive, and either condition may be accompanied by either convergent *or* divergent deviations.

3. An overactive inferior oblique muscle, if associated with convergent strabismus will augment internal rotation, and if present in a case of divergent strabismus will increase the divergent deviation. Weakening of the overacting inferior oblique muscle will decrease the vertical deviation, as well as the prevailing divergent *or* convergent element of the squint.

4. An underactive inferior oblique muscle, if associated with divergent strabismus, will permit greater divergence, and if accompanied by a convergent squint will permit greater convergence. Strengthening of an underactive inferior oblique muscle will lessen the vertical element but will augment the divergent *or* convergent deviation, whichever prevails.

5. Nonrecognition of the true subsidiary action of the inferior oblique muscle may lead to errors in diagnosis as well as to unexpected surgical failure.

RIASSUNTO

1. Viene studiata l'azione del muscolo obliquo inferiore dell'occhio.

La sua azione principale è la torsione verso l'esterno che aumenta nella rotazione esterna o abduzione. Le sue azioni sussidiarie sono: la elevazione che aumenta nella rotazione interna o adduzione—e la rotazione interna o adduzione e la rotazione esterna o abduzione, a seconda della posizione del globo oculare: la rotazione interna prevale quando l'occhio è in posizione di rotazione interna, e la rotazione esterna quando l'occhio è in posizione di rotazione esterna.

2. Clinicamente, il muscolo obliquo inferiore può essere iper- o ipotonico, e tali condizioni possono essere accompagnate

sia da strabismi convergenti che da strabismi divergenti.

3. Se un ipertono del muscolo obliquo inferiore si trova associato ad uno strabismo convergente ne risulterà aumentata la rotazione interna; se, viceversa, si trova associato ad uno strabismo divergente, ne risulterà accentuata la deviazione divergente. Un indebolimento di tale ipertono diminuirà la deviazione vertcale cosí come l'elemento prevalente, divergente o convergente, dello strabismo.

4. Se un ipotono del muscolo obliquo inferiore si trova associato ad uno strabismo divergente produrrà una divergenza maggiore; se, viceversa, si trova associato ad uno strabismo convergente produrrà una convergenza maggiore. Un ulteriore accentuazione di tale ipotono diminuirà la componente verticale ma aumenterà la deviazione prevalente, divergente o convergente, dello strabismo.

5. La mancata valutazione dell'azione sussidiaria del muscolo obliquo inferiore potrà partare ad errori di diagnosi e ad inaspettati insuccessi della cura chirurgica.

RÉSUMÉ

1. L'auteur discute de l'action du muscle oblique inférieur. L'action primordiale c'est l'extorsion en accentuant la rotation externe ou l'abduction. Les actions secondaires sont l'élévation—qui augmente dans la rotation interne ou l'adduction; aussi la rotation interne ou l'adduction et la rotation externe ou l'abduction selon la position du globe oculaire. Larotation interne existe si l'oeil est en position de rotation interne; et en rotation externe si l'oeil est en rotation externe.

2. Au point de vue clinique, le muscle oblique inférieur peut prévaloir ou être insuffisant; il y a alors une déviation convergente ou divergente selon le cas.

3. Le strabisme convergent est amené par un muscle oblique inférieur trop tendu et, s'il existe avec un strabisme divergent, augmentera une déviation divergente. Une faiblesse du muscle oblique inférieur diminue la déviation verticale.

4. Un muscle oblique inférieur insuffisant associé à un strabisme diver gent, accentuera une plus grande divergence; s'il est accompagné d'un louchement convergent permettra une plus grande convergence. Fortifier un muscle oblique inférieur insuffisant amènera une diminution de l'élément vertical mais augmentera la déviation divergente ou convergente qui persistera.

5. Ne pas évaluer justement l'action associée du muscle oblique inférieur amenera des annuis de diagnostic et des insuccés opératoires.

ZUSAMMENFASSUNG

1. Es wird die Aktion des unteren schraegen Augenmuskels besprochen. Sie besteht in erster Linie in einer Auswaertsdrehung, die bei Aussenrotation oder Abduktion zunimmt. Die zusaetzlichen Funktionen sind Hebung des Augapfels, die bei Innenrotation oder Adduktion zunimmt, und—je nach der Stellung des Auges—sowohl Innenrotation oder Adduktion als auch Aussenrotation oder Abduktion; Innenrotation entsteht, wenn sich das Auge in Innenrotationstellung befindet, und Aussenrotation tritt ein, wenn sich das Auge in Aussenrotationstellung befindet.

2. Klinisch kann eine gesteigerte oder eine verminderte Aktion des unteren schraegen Augenmuskels vorliegen. Beide Krankheitszustaende koennen mit konvergentem oder divergentem Schielen einhergehen.

3. Ein ueberaktiver unterer schraeger gentem Schielen die divergente Abweichgentem Schielen einhergeht, die Innenrotation vergroessern und im Falle von divergentem Schielen die divergente Abweichung vertaerken. Eine Schwaechung des ueberaktiven unteren schraegen Augenmuskels wird zc einer Verminderung sowohl der vertikalen Abweichung als auch der vorherrschenden divergenten oder konvergenten K o m p o n e n t e des Schielens fuehren.

4. Ein schwach funktionierender unterer schraeger Augenmuskel wird bei gleichzeitigem B e s t e h e n divergenten Schielens eine Verstaerkung der Divergenz zulassen und bei gleichzeitigem Be-

stethen von konvergentem Schielen eine Verstaerkung der Konvergenz gestatten. Eine Staerkung des schwach funktionierenden unteren schraegen Augenmuskels wird zur Verminderung der vertikalen Komponente aber zu einer Erhoehung der vorherrschenden divergenten oder konvergenten Abweichung fuehren.

5. Eine Verkennung der wahren Nebenaktionen des unteren schraegen Augenmuskels kann zu diagnostischen Irrtuemern und zu unerwarteten chirurgischen Versagern fuehren.

RESUMEN

1. Se discute la acción del músculo oblícuo inferior. La acción primaria es extorsión, con aumento en rotación externa o abducción. Las acciones subsidiarias son elevación, con aumento en rotación interna o aducción, dependiendo de la posición del globo la rotación interna o aducción y la rotación externa o abducción; la rotación interna prevalece cuando el ojo se encuentra en la posición de rotación interna y la rotación externa ocurre cuando el ojo se encuentra en la posición de rotación externa.

2. Clínicamente, el músculo oblícuo inferior puede actuar en exceso o en defecto, pudiendo acompañarse esto de desviaciones convergentes o divergentes.

3. Un músculo oblícuo inferior que actúa en exceso, si se encuentra asociado con estrabismo convergente, aumentará la rotación interna, y si se trata de estrabismo divergente aumentará la desviación divergente. Debilitando la acción excesiva del músculo oblícuo inferior disminuirá la desviación vertical, así como el elemento divergente o convergente predominante del bizco.

4. Un músculo oblícuo inferior que actúa en defecto, si se encuentra asociado con estrabismo divergente, permitirá mayor divergencia, y si se encuentra acompañado por un bizco convergente permitirá mayor convergencia. Fortaleciendo la acción en defecto del músculo oblícuo inferior disminuirá el elemento vertical pero aumentará la desviación divergente o convergente, que prevalece siempre.

5. La falta de reconocimiento de la acción subsidiaria verdadera del músculo oblícuo inferior puede conducir a errores de diagnóstico, así como a fracasos quirúrgicos inesperados.

SUMÁRIO

1. A ação do muculo inferior obliquo é discutida. A ação primaria é torsão externa, a qual aumenta em rotação externa ou abdução. As ações subsidiarias são elevação, que aumenta em rotação interna ou adução, e em ambos rotação interna (ou adução) e rotação externa (ou abdução), dependendo da posição do globo; a rotação interna prevalece quando o ôlho está em posição de rotação interna e a rotação externa ocórre quando o ôlho está em posição de rotação externa.

2. Clinicamente, o musculo inferior obliquo póde estar hipertonico ou hipotonico e ambas condições podem ser acompanhadas por desvios convergentes ou divergentes.

3. Um hypertonico musculo obliquo inferior, si associado a estrabismo, póde aumentar a rotacão interna e, si presente em um caso de estrabismo divergente, poderá aumentar o desvio divergente; o enfraquecimento do musculo obliquo inferior hipertonico podera diminuir o desvio vertical, tão bem como o elemento dominante convergente ou divergente do estrabico.

4. Um musculo obliquo inferior hipotonico, si associado com estrabismo divergente, permitirá grande divergencia, e si acompanhado por estrabismo convergente permitirá maior convergencia. A distensão de um musculo obliquo inferior diminuirá o elemento vertical mas aumentará o desvio divergente ou convergente que sempre domina.

5. O não reconhecimento da real ação subsidiaria do musculo obliquo inferior póde conduzir a erros diagnosticos tanto como a fracassos cirurgicos inesperados.

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First Meeting
of the
French Chapter
of the
International College of Surgeons
Bordeaux, France, May 13, 14 and 15

The first meeting of the French Chapter will be officially opened at 10:30 a.m., Tuesday, May 13, 1952, by Prof. Dr. Raymond Darget, President of the French Chapter, and Prof. Dr. Georges Portmann, Dean of the Faculty of Medicine, Bordeaux.

The opening session will be immediately followed by a reception at the Hotel de Ville, given in honor of the visiting surgeons by M. Chaban Delmas, Deputy Mayor of Bordeaux.

On May 13 and 14, Operative Clinics will be presented at Bordeaux Hospitals and Clinics:

1. Surgery of the Base of the Tongue—Prof. Georges Portmann
2. Malignant Tumors of the Bladder and Radium Therapy Surgical Enervation of the Bladder—Prof. Dr. Raymond Darget
3. Vascular Surgery—Prof. Jean Massé
4. Cancer of the Esophagus, Esophagectomy and Esophagoplasty —Prof. Robert Dufour
5. Neurosurgery and Bone Surgery—Prof. Dr. Louis Pouyanne
6. Gynecologic Operations—Prof. Dr. J. Magendie
7. Ophthalmic Surgery—Prof. Dr. Jean Beauvieux
8. Thoracic and Gastric Surgery—Dr. Georges Marc Dubourg
9. Radium Treatment in Cancer Surgery—Prof. Dr. Albert Lachapèle

In addition to the open sections of the meeting, papers on the following special themes will be presented:

1. Arterial Hypertension—Its Diagnosis and Treatment
2. Surgical injury of the Ureter
3. Laminectomy and Vertebral Grafts

For complete information, please write to Prof. Dr. Raymond Darget, 17, rue Castéja, Bordeaux, France.

Occupational Injuries of the Eye and Their Treatment; Medications

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INDIANAPOLIS, INDIANA

IN the surgical care of any eye, that surgical procedure which is the simplest and requires the least manipulation of the eye or its adnexa is the procedure of choice. Medication should be based on the same principle; those medicaments should be chosen which are mildest, give the patient the least discomfort and give rise to the least side reactions. This is a lesson I learned sixteen years ago under the tutelage of the then noted Webb W. Weeks at Bellevue Hospital, New York. It has been borne in mind and has proved true in my office practice. I have tried nearly every drug on the market, and have obtained the best results with less irritating, bland preparations with few side reactions.

I have made two lists, placing on one side those I consider best applicable to dispensary and office use, and on the other those I consider less applicable. It must be remembered, however, that both columns contain many drugs advocated by the best ophthalmologists. I shall therefore try to give my own reasons for the elimination of those in the right-hand column in the care of my industrial patients.

It is entirely possible that some of these drugs have been eliminated as a result of false observation. In fairness to any drug so eliminated, I wish to state that I have tried it again and again with repetition of similar undesirable effects, and then deleted it again from my armamentarium. I feel that if a drug can be the cause of an allergic reaction in a conjunctiva, it can be the source of more loss of time to an injured employee than the drug is worth.

Also, I have noted on many occasions that once an allergic condition occurs in a conjunctiva there is added susceptibility of that tissue to a flare-up of whatever pathogen was present before. For instance, I have seen mild purulent conjunctivitis of mild grade apparently subside when penicillin ointment, sulfathiazole ointment or yellow oxide ointment was first used and then become much worse a few days later. Every ophthalmologist has observed cases of full-blown penicillin sensitivity continuing long after a single use of the ointment, resistant to any treatment and resulting in prolonged loss of an employee's time. In some cases the marked chemosis and "tearing" frighten the patient so much that he is unwilling to return to work and in some instances cannot bring himself to believe that there will be no visual loss when he recovers from the allergic episode. I have seen styes occur because of the use of penicillin ointment, recur as long as penicillin ointment is used by a patient, and then stop when the ointment is omitted—this in spite of the fact that penicillin is said to be bacteriocidal and was once advocated as the best agent against Staphylococcus aureus, the usual cause of styes. I feel that sodium sulfacetimide solution (now called "sulamyd") is a much more valuable topical drug for the prevention of acute and chronic staphylococcic infections in the conjunctiva, although it is supposed to be only bacteriostatic. However, in preference to parenteral penicillin or sulfadiazine for purulent chalazia and styes of the eyelids I have for four years injected several hundred times a small quantity (a few drops to 0.5 cc.) of a penicillin solution containing 1,000 units of penicillin G within and around styes, purulent chalazia, imminent and actual orbital abscesses and acutely inflamed tear sacs. (adjacent tissue only) after injection of a few drops of procaine hydrochloride under the skin, with almost imme-

Submitted for publication October 5, 1951.

Drugs Used in Corneal and Conjunctival Cases

Applicable
Anesthetic Solutions
Pontocaine (½%)
For limbus only, cocaine (1%) used sparingly
Holocaine (1%) in cases of prolonged healing or when pontocaine sensitivity is present
Pupil Dilators
None, but homatropine (5%) if eye is soft or iritis seems impending on second dressing
Anesthetic Ointments
Holocaine or holocaine and epinephrine ointment
Lubricators
Castor Oil
Antiseptic Solutions
Sulamyd (sulfacetimide) 10%
Boric acid solution
Sulfoptol
Aureomycin and Terramycin
Antiseptic Ointments
Bacitracin ointment
Boric acid 5% or 10% ointment
Sulfacetimide
Special medicament for burns flashes, etc.:
Hydrosulphosol (E. C. Leintz Co.)
Staining Solutions
Sodium fluorescein, 2% (with pinch of soda)
Aqueous mercurochrome, 1%

Less Applicable
Anesthetic Solutions
Cocaine (any percentage)
Butyn
Metycaine
Pupil Dilators
Atropine solution
Atropine in combination
Atropine in ointment
Homatropine routinely
Anesthetic Ointments
Butyn ointment
Butyn and metaphen ointment
Pontocaine ointment
Nupercaine ointment
Metycaine ointment
Butyn and bichloride ointment
Lubricators
Mineral oil
Cod liver oil
Antiseptic Solutions
Bichloride
Argyrol and neosilvol
Metaphen
Zephiran
Penicillin
Proprion
Zinephrin
Gantrisin
Antiseptic Ointments
Penicillin ointment
Butyn and metaphen ointment
Aureomycin ointment
Bichloride ointment
White's ointment
Yellow oxide ointment
Sulfathiazole ointment
Sulfadiazine ointment

Other Needs for Dispensary.—1. Pledgets of cotton, pencil size, tightly wound on end of toothpicks. 2. Eye droppers in container sterilized between cases. 3. Large rubber-bulbed syringe for flushing or De Vilbiss No. 190 irrigator. 4. Toothpick applicators. 5. Eye pads. 6. Adhesive tape or Scotch tape, ½-inch and 1-inch width adhesive tape. 7. Reclining chair with head rest, flat table or couch. 8. Binocular loupe or head magnifier. 9. Spotlight or flashlights. 10. Sterile covered containers. 11. Benson eye irrigating unit (in factories handling chemicals). 12. Zephiran 1-1,000, with anti-rust tablets for spuds or other metal instruments. 13. Golf-stick spud (Storz Instrument Co., St. Louis).

diate, permanent results, and it has certainly lessened the duration of discomfort, swelling and morbidity in practically every case in which it was used. The suppuration of an acute chalazion having been removed in this manner, the chalazion can be incised and curetted from the conjunctival surface or extirpated through a cutaneous wound with impunity.

Sulfacetimide in the form of a solution is a universal antiseptic and, in my opinion, a godsend to those engaged in industrial ophthalmology. I firmly believe that this solution belongs and will remain on the table of every ophthalmologist who deals with industrial problems. It is now available as 10 per cent solution in 1-drachm bottles; the price is approximately 35 cents per bottle or $35 per hundred bottles; it is suitable for after-use by the industrial patient and might be worth investigation as a preferable alternative to the penicillin ointment usually dispensed. In this service, in four years' routine use of the drug in 10 per cent solution, we have encountered only 1 case of hypersensitivity involving loss of working time, although there have been a few mild reactions. We have used the drug with impunity in the treatment of many patients who stated that they were hypersensitive to the parenteral sulfas. When such a statement is made we use it sparingly, but we still do not substitute penicillin. We early discontinued the use of full strength sulfacetimide, or "sulamyd." Some patients would not use it because of the irritation caused by the strong 30 per cent solution, whereas none objected to the diluted 10 per cent solution. Con-

versely, we have no confidence in sulfathiazole or sulfadiazine ointment, having seen many undesirable allergic reactions resulting therefrom. We have hesitated to use sulfacetimide ointment, suspecting it might cause similar disability, but in this we may be mistaken, and unfairly so. It is almost universally observed that any antibiotic in ointment form, applied in the region of the eyelids (which are seemingly more susceptible than most other cutaneous surfaces), is apt to start an allergic reaction, while the same drug topically placed in the eye in solution does not. Up to the time of writing we have not encountered this with ophthalmic bacitracin ointment, which does seem quite effective (we limit its use, however, to application at bedtime).

We have never been overimpressed by the strict need of an antiseptic in the treatment of abrasions or foreign bodies of the superficial cornea or conjunctiva, although since the advent of sulfacetimide we have used it routinely, in the form of 1 or 2 drops instilled before the lubricant and the bandage are applied. I remember well a long period shortly after the war in which my associates and I treated these conditions in several hundred consecutive cases without antiseptics, using only castor oil, and holocaine ointment and patching. In those cases, however, we inspected the conjunctivae thoroughly, and if there was any sign of bacterial conjunctivitis we did use topical silver nitrate (0.5 per cent) applied to the lid conjunctival surfaces at the first and any needed subsequent visit. In my opinion, continuous pressure patching of the eye (with emphasis on pressure) while there is still rawness of the cornea as shown by fluorescin stain is more important than the use of an antiseptic. The absence of friction by the upper eyelid until the wound is healed is of prime importance and is brought about by a pressure patching under which is instilled 1 or 2 drops of "sulamyd," then 3 or 4 drops of ordinary castor oil and ½ inch of holocaine ointment or holocaine and epinephrine ointment. The patch is kept on for twelve to twenty-four hours or even longer if the extent of the abrasion is large or the wound is deep. In our experience, less than twelve hours' patching has proven too short a time for good healing. Pain under the bandage is taken care of by aspirin compounds, anacin, or codeine with aspirin or by hypodermics when too severe, rather than by removing the bandage or treating the pain with topical anesthetic drops. Castor oil is given in dropper bottle (rather than antiseptic drops or ointment) for after-care by the patient when the cornea is found to give no further fluorescine stain.

Very few patients with corneal foreign bodies or small shallow abrasions are potentially infected unless pre-existing conjunctivitis is present, or unless infection is introduced by attempted removal of the foreign body by the patient or one of his fellow-workers with a handkerchief or soiled hands or match sticks, etc. Nevertheless we recommend the use of sulfacetimide, thorough irrigations with boric acid, patching as suggested, a careful dispensary aseptic technic, and above all a hearty "come-to-the-dispensary-instead-of-removing-it-yourself" program.

SUMMARY

The author's experience in observation and treatment of occupational ocular injuries is outlined, with emphasis on the fact that when surgical treatment is necessary it should be handled by the simplest possible technic, one that requires a minimum of manipulation, either of the eye or of its adnexa. Similarly, that form of medication should be used which is mildest and gives the patient as little discomfort as possible. Two lists of drugs are given, one containing the medications preferred by the author and the other made up of alternative but less applicable preparations. The dangers associated with conjunctival allergic reactions to certain drugs are pointed out.

RIASSUNTO

Viene esposta l'esperienza dell'autore in fatto di osser vazione e cura di lesioni

traumatiche professionali degli occhi—con speciale insistenza sul fatto che, quando è necessario ricorrere ad un intervento chirurgico, esso deve essere eseguito con la tecnica più semplice possibile e che richieda un minimo di manovre sull'occhio e sui suoi annessi. Similmente, si deve usare la medicazione meno dolorosa e che dia meno disturbi al paziente.

Vengono forniti due elenchi di medicamenti, uno di quelli preferiti dall'autore e l'altro di preparati smili ma di minor uso.

Vengono sottolineati i pericoli derivanti da reazioni allergiche della congiuntiva di fronte a certe sostanze medicamentose.

SUMÁRIO

A experiencia dos autôres na observação e tratamento de traumas oculares ocupacionais é delineada, realçando-se o fato de que, quando o tratamento cirurgico é necessario, deve ser manejado pela tecnica mais simples possivel, uma que requeira um minimo de manipulações, seja do ôlho ou de seus anexos. Similarmente, a forma de medicação a ser usada deve ser a mais suave e a que dê ao paciente o menor disconfôrto possivel. Duas listas de drogas são apresentadas, uma contendo as medicações preferidas pelo autôr e a outra feita de preparados alternativos mas menos aplicaveis. Os perigos associados a reações allergicas conjuntivais de certas drogas são estabelecidos.

RÉSUMÉ

L'auteur, s'appuyant sur son expérience des traumatismes oculaires d'accident de travail, insiste pour qu'un traitement chirurgical précoce soit institué, lequel doit être des plus simples—nécessitant très peu de manipulations soit de l'oeil ou de ses adventices. La même procédure doit exister dans l'emploi de la médication. On enumère des médicaments, ceux recommandés par l'auteur, ceux en usage mais moins recommandables à cause du danger de réactions allergiques de certains d'entre eux.

RESUMEN

Se señala la experiencia del autor en la observación y tratamiento de lesiones oculares ocupacionales, insistiéndose sobre el hecho de que cuando el tratamiento quirúrgico es necesario debe efectuarse con la técnica más simple posible, aquella que requiera el mínimo de manipulación del ojo o sus anexos. Asimismo, debe usarse la forma de medicación más moderada y que dé al paciente la menor molestia posible. Se dan dos listas de drogas, una conteniendo los medicamentos perferidos por el autor y otra integrada por preparaciones alternantes pero menos aplicables. Se señalan los peligros asociados a reacciones alérgicas conjuntivales por ciertas drogas.

ZUSAMMENFASSUNG

Es wird ein Ueberblick ueber die Erfahrungen des Verfassers in der Beobachtung und Behandlung von Berufsverletzungen des Auges gegeben. Dabei wird hervorgehoben, dass im Falle der Notwendigkeit chirurgischer Behandlung eine moeglichst einfache Technik, die ein Minimum von Manipulationen des Auges oder seiner Anhangsorgane erfordert, angewandt werden soll. In aehnlicher Weise sollte auch die mildeste und den Kranken am wenigsten belaestigende Form der Arzneianwendung gewaehlt werden. Es werden zwei Listen von Medikamenten vorgelegt, von denen die eine die vom Autor bevorzugten Arzneien und die andere weniger geeignete Praeparate zur Auswahl enthaelt. Es wird auf die Gefahren, die mit den allergischen Reaktionen der Bindehaut gegenueber gewissen Medikamenten verbunden sind, hingewiesen.

Eye Problems in Boxing

C. H. ALBAUGH, M.D., F.A.C.S., F.I.C.S.
LOS ANGELES

THIS report deals with my personal experience as a consulting physician to the Athletic Commission of the State of California during the past six years. It includes observation of 154 injured or allegedly injured eyes in 92 cases referred from the Athletic Commission or from the Boxers and Wrestlers Benefit Fund of California.

Not only the specific medical problems connected with ocular injuries but the sociologic and sporting aspects of boxing injuries will be discussed in this paper. From this point of view, and on the basis of many interesting experiences gained in the capacity of consultant, some general recommendations will be made which may be of value in protecting the individual athlete.

In order to safeguard those who participate in boxing matches, both professionally and nonprofessionally, the Athletic Commission of the State of California has set up certain requirements for licensing as well as certain rules regulating the conduct of the sport. These rules and regulations include a clause permitting special hearings before the Commission should any fighter be dissatisfied with a decision that has been made with regard to him. This fact alone speaks for the basic fairness of the rules.

Among regulations set up to safeguard physical welfare are the following:

Each fighter must be examined by a qualified physician before being licensed. Special emphasis is placed upon examination of the eyes.

Physical and ophthalmologic examinations must be repeated yearly as long as the fighter remains licensed. They are also obligatory at any other time the Commission may direct, including the time immediately before each bout. On returning to the state of California after participating in a contest elsewhere, the fighter is required to submit to a physical examination. These rules are extremely important when injury is suspected, since athletes and their managers are sometimes so fearful of disqualification that they are reluctant to report an injury.

Contests can be held only between fighters who are well matched. Differences of more than 12 pounds (5.4 Kg.) in weight are not permitted, except in the class which exceeds 175 pounds (79.4 Kg.). Referees are specifically required to stop any match if it becomes evident that one man greatly outclasses his opponent.

From the ocular standpoint, no man may be licensed if he is blind in one eye, if he has any pathologic lesion in either eye, or if vision, for any reason, is so poor in one eye as to cause the examining physician to recommend that the license be withheld.

Decisions as to the physical fitness of boxers, especially when there are eye problems, are difficult to make and may raise storms of protest from followers of the sport, but the examining physician has the assurance of complete backing by the Commission. It is no wonder, therefore, that the State Athletic Commission can always depend on medical cooperation in the community.

Assistance is provided for injured fighters in the state of California through the Boxers and Wrestlers Benefit Fund, which is sustained by voluntary donations from the purse of the fighters and is administered by a board of trustees. Assistance may take any nature deemed advisable by the board—medical assistance, including professional and hospital fees, drugs, orthopedic appliances, glasses, etc., or living expenses during periods of enforced inactivity. It has even been given to provide decent burial.

Because of its very nature, such a fund

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is occasionally subject to abuse. Fighters who are disqualified for licenses in California often go elsewhere, but return when further disabled, expecting assistance from the Fund. Technically, the trustees might refuse help, and rightly so; but they seldom do, and they usually go out of their way to give the fighter the benefit of the doubt. Such abuse could be prevented by the establishment of uniform national and international rules governing athletic contests, and by the establishment and maintenance of funds similar to the one set up in California.

Although similarities exist between the types of eye injury resulting from boxing and those resulting from other occupations, some important differences must be noted.

Eye injuries resulting from boxing are confined to a definite age group. Boxers, for example, are licensed in California only between the ages of eighteen and thirty-six. Exceptions are extremely rare.

Damage to the eye is almost always the result of a direct blow upon the eyeball, and is usually severe enough to cause profound pathologic changes.

In addition to this, because of fear of disqualification, many severe injuries are not reported until so long after they occur that healing processes have become well established and it is much too late for adequate constructive treatment. Sometimes it is only in the course of a qualifying examination that a lesion of the eye is discovered, and in other cases the injured men retire from fighting to find that poor vision is a deterring factor in obtaining other employment; only then do they apply to the Boxers and Wrestlers Benefit Fund for help.

One of the tragic features of eye injuries sustained in boxing is that all too often they are bilateral, and therefore completely disabling. In the series of 154 eye injuries included in this study, 18 were bilateral (almost 12 per cent). Also, in nearly all instances of eye injury, the lesions were multiple; that is, they involved more than one structure of the eye.

Of the 154 injured eyes, 38 had cataract, and in 10 instances this was bilateral. Other structures besides the lens frequently were damaged. Lid ecchymosis was present in 4, macular contusion in 2, vitreous hemorrhage in 3, retinal separation in 8, and traumatic iritis in 2. Often it was impossible to determine the extent of the damage to the all-important choroid. Strangely enough, no instance of Vossius ring cataract was observed in this series. Unfortunately, of the 38 traumatic cataracts, only 1 has been operated on at the time of writing. Other patients may have undergone operation elsewhere, but no follow-up has been possible. The result obtained in the 1 operative case was excellent, with 20/20 vision (corrected).

A surprising observation in those cases that could be followed was that 4 of the cataracts disappeared spontaneously. All were of the star-shaped posterior subcapsular type. In none of the 4 cases was any treatment directed specifically toward the lenticular lesion. The cataracts simply cleared by themselves. One of the boys commented that he had been advised to use honey instillations to get rid of the cataract, and had done so over a period of eight months. Of the 4 cases that cleared spontaneously, one required a month, one required two months, and two required two years. No explanation for the spontaneous clearing is apparent.

Of the 154 injured eyes, 29 showed retinal separation, and in 2 of these the injury was bilateral. Additional damage to these eyes occurred as follows: cataract in 8, traumatic iritis in 2, macular contusion in 1, and vitreous hemorrhage in 4. Generally, the period between injury and examination was a long one, and in only 5 of these cases of retinal separation was operation considered advisable. Of the 5 patients that were operated on, only 1 obtained a reattachment. In the hands of all ophthalmologic surgeons in this vicinity, the results of reattachment operations have been so poor that the trustees of the Boxers and Wrestlers Benefit Fund have been consistently hesitant to authorize such surgical therapy and its attendant expense. They have been willing to have operation attempted only when the prog-

nosis appeared unusually favorable.

Nearly all of the eyes showed disinsertion of the retina, with or without other holes. In all of them there was profound disturbance of the vitreous, as evidenced by many opacities, both large and small, present for a long time after the initial injury. This probably accounts in part for the poor surgical results obtained by all eye surgeons who handle this type of traumatic separation. Furthermore, it may be postulated that the changes in choroidal circulation that occur as a result of severe contusion may play a part in failure of the retina to become reattached in a reasonable number of cases. Undoubtedly, the length of time between injury and medical examination is also an important factor in the unsatisfactory surgical results.

Contusion of the macula as the sole injury occurred in 5 eyes. Orbital ecchymosis alone was discovered in 5 eyes. In 2 of these it involved the superior oblique muscle, in 1 the lateral rectus muscle and in 1 the whole third nerve.

There was a group of alleged injuries, of which 8 proved to be infections of the external ocular structures. In only 2 cases in the series was there evidence or history of trachoma. The patients in both cases had been under treatment.

Statistically, at least, boxers who sustain eye injuries make a poor showing for successful medical rehabilitation. Furthermore, the follow-up is embarrassingly poor.

It must be recognized, however, that these patients are not under the direct control of the physician, and as a group do not take injuries seriously. Often they drift about to the clinics and county hospitals because of financial reverses. Most of them are very well developed as to the ego and hence are too proud to apply to the Boxers and Wrestlers Benefit Fund for assistance until all other sources of help have been exhausted. Some move to other parts of the country, and many are so busy trying to build a new career that they do not find time to seek medical care. As a class, boxers seem to be quite blind to the fact that their career must of necessity end after a pitifully few years; hence they make no provision for later life. They are notoriously free spenders, and often, when told that they are being permanently disqualified, beg for one last match to put them on their feet financially or to get them out of debt.

In the past the tendency has been for some of these men to drift into questionable occupations, and the public has not been kind to "ex-pugs." One of the men whose case was studied in this series is an outstanding example of what can happen. He was disqualified from boxing, drifted into a career of crime and finally wound up in the State Penitentiary.

The ophthalmologist can be of considerable assistance to the Benefit Fund and to the Commission in taking care of these boxers when they are forced to terminate their athletic careers. He is in constant contact with the various social and rehabilitation agencies and can see that the ex-fighter is directed to one that will assist him in getting back on his feet and prevent him from becoming a public charge. If rehabilitation is not possible, the ophthalmologist can be of great help in seeing that the permanently disabled can secure proper state aid. The Boxers and Wrestlers Benefit Fund can and does help to tide these men over for a limited time, but it cannot support them indefinitely.

So far as prevention of eye injuries due to boxing is concerned, there has long been a need for a practical device for this purpose. Various eye protectors have been suggested for use in the ring, many of which have been tried and all of which have been found inadequate. It is to be hoped that some effective protector can be perfected that will not meet with the disapproval of the world of athletics.

A careful evaluation and study of the cases in this series has led to thoughtful recommendations for the handling and assistance of injured athletes.

First of all, as a prerequisite to the issuance of a boxing license and to the physical examination required, an educational indoctrination course should be provided. This type of course has been found valuable in many other occupations. Po-

tential boxers should be made aware of the physical and financial hazards of their occupation and of the rehabilitation services that are available to them should they be injured. They should be urged to make proper financial plans or to establish trust funds, with a view to the inevitable time of retirement.

Distillation of material from discussions with experts in the athletic world makes it appear advisable that a general training in the art of boxing, both offensive and defensive, be required of every applicant for a license to box. Apparently many fighters who enter the ring do so without adequate basic boxing training, and seem to be quite unable to protect themselves under severe pressure. Perhaps it might be well for state athletic commissions to consider the establishment of such basic training courses, given by special instructors, licensed for that purpose.

RESUMEN

El autor basa su comunicación sobre problemas oculares en el boxeo en su experiencia personal, como médico consultante de la Comisión Atlética del Estado de California. Esta experiencia abarca seis años e incluye la observación de 154 ojos lesionados o declarados lesionados. El problema es complicado, comprendiendo aspectos social, económico y médicolegal, así como decisiones terapéuticas. Se discuten la prevención y el tratamiento.

ZUSAMMENFASSUNG

Der Bericht des Verfasser ueber im Zusammenhang mit Boxen auftretende Augenprobleme stuetzt sich auf seine persoenlichen Erfahrungen als beratender Arzt der Athletischen Kommission des Staates Kalifornien. Seine Erfahrung erstreckt sich ueber 6 Jahre und umfasst die Beobachtung von 154 verletzten oder angeblich verletzten Augen. Das Problem ist kompliziert, da es soziale, oekonomische und gerichtsmedizinische Gesichtspunkte sowohl als therapeutische Entscheidungen einschliesst. Prophylaxe und Therapie werden eroertert.

SUMÁRIO

O autôr basêa seu relatorio sobre problemas oculares apoiando-se em sua experiencia pessoal como medico responsavel pela Comissão Athletica do Estado da California. Esta experiencia cobre seis anos e inclúe a observação de 154 olhos traumatizados ou supostamente traumatizados. O problema é complicado, envolvendo aspetos sociais, economicos e medico-legais tão bem como decisões terapeuticas. Prevenção e tratamento são discutidos.

RÉSUMÉ

L'auteur, s'appuyant sur son expérience de médecin consultant de la Commission Athlétique de l'état de Californie, donne une liste de 154 cas d'yeux traumatisés sur une période de six ans. Le probème est complexe à cause des situations sociales, économiques et médico-légales en même temps que thérapeutiques. On y discute la prévention et le traitement.

RIASSUNTO

L'A., nel trattare i problemi dell'occhio in rapporto al pugilato, si giova dell'esperienza che gli deriva dalla sua qualità di Consulente della commissione Atletica dello Stato della California.

Tale esperienza dura da 6 anni e si basa sull'osservazione di 154 occhi lesi o supposti tali.

Il problema è assai complesso, comprendendo aspetti sociali economici e medico-legali—e implicando la necessità di decisioni terapeutiche.

Vengono discusse profialassi e terapia di tali lesioni.

Enucleation Implant

C. H. ALBAUGH, M.D., F.A.C.S., F.I.C.S.
LOS ANGELES

DEMANDS of youthful veterans of the recent war for cosmetically suitable artificial eyes have created a recent sharp upsurge of interest in enucleation implants. Response to such demands has come not only from the medical but from the industrial field. Research, prohibitively expensive under ordinary conditions, during the war made available new materials and new ways of using well known materials; and wartime cooperation between various groups with special skills made possible the development of new concepts in the rehabilitation of maimed and injured personnel.

Undoubtedly, antibiotics, in a large measure, are responsible for the successful use of new implants. Extrusion has been caused more often by secondary infection than by foreign body reaction. Control of infection can give the tissues time to encapsulate an implant firmly and safely.

Thus far only a beginning has been made. Doubtless the implants of today represent only one step in the evolution of devices which, in the future, will be a credit to restorative medicine.

In the past, when the blown-glass reform eye was the only type of prosthesis available, it seemed apparent that enucleation with simple closure and without implantation was the best all-around operation. Disappointment followed the use of buried implants of all types; and all types were used—everything from rabbits' eyes to the head of the femur of a newborn infant, to glass or gold spheres. A large percentage of implants either extruded or migrated into the orbit and had to be removed. Development of the plastic artificial eye made it possible for the body to tolerate implants to a greater degree, both because of the implant's lightness and because it could be molded to fit contours, thereby obviating pressure necrosis. Ruedeman[1] of Cleveland ushered in the new era in 1945, when he reported his success in exteriorizing a portion of the implant to allow direct attachment between implant and prosthesis. Cutler,[2] working independently, simultaneously achieved the same result. Since then, Stone and Jardon,[3] as well as Hughes,[4] have presented important modifications of the exteriorized implant. Since some of these recent implants have extruded, the present one was designed with the intention of lessening this danger.

To assure the utmost in durability, this new implant is made of an acrylic plastic —the same material used for crowns and inlays in dentistry. Essentially it consists of two portions, a body with a female thread and a cap with a male thread. The body, which in general appearance resembles a short-necked flask or bottle, can be obtained in various sizes, but is most commonly used in a 12-mm. diameter. Except at the neck, where the female thread is placed on the inner surface, the body is spherical. Fenestrations are placed in the posterior area to allow orbital tissues to penetrate and obtain a firm hold. Four special fenestrations are placed just below the neck for introduction of the individual rectus muscles. The undersurface of the cap is supplied with a short screw to fit the female thread in the body. Its anterior surface is precision-made by a steel die, so that two grooves, perpendicular to each other, appear on its surface. These give positive contact between the implant and corresponding ridges in the prosthesis, yet allow for disengagement under unusual strain.

Technical Data.—The technic of the operation is as follows: The patient is prepared for implantation as for the usual enucleation, but especial care should be taken to preserve the conjunctiva around

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the limbus. Therefore, dissection of the conjunctiva from the limbal area must be done more carefully than usual. It is also advisable occasionally to make a horizontal incision temporally, approximately 6 mm. long, so that delivery of the globe will not cause rupture of the conjunctival ring. Each rectus muscle is then isolated and, before it is cut free from its insertion, is caught with a mattress suture of No. 4-0 chromic catgut. The muscle is then severed from the globe and allowed to retract with the suture attached. This procedure is carried out on each of the rectus muscles, except that in the medial rectus the suture is placed just behind a mosquito clamp used for fixation.

After removal of the globe, the usual pressure pack should be held over the orbit for ten minutes by the clock. This is done to assure facile manipulation of the implant in a relatively bloodless field.

After the implant is inserted into the cavity within Tenon's capsule, the various muscle sutures are threaded through their respective special muscle fenestrations in the implant. A small red dot appears on the anterior face of the implant. When the implant is properly placed, this dot should be in the superior position.

The surgeon, working through the open neck of the implant, then overlaps the tendons of the opposing muscles and sutures them firmly together. The superior and inferior recti are crossed and sutured together, and then the lateral rectus and the medial rectus are handled in a similar manner. A purse-string suture is then placed in the conjunctival wound edge and is tightened so that the mucous membrane fits closely to the flared collar around the neck of the implant. If a horizontal incision has previously been made in a lateral direction, it can then be closed with interrupted silk as desired.

The cap of the implant is screwed on by means of the special screwdriver supplied with each set. Threading is so designed that the oval of the cap will be approximately horizontal when the screw has been tightened. The blank conformer with mated grooves to fit the cap may be put in place or left out, at the discretion of the surgeon.

Reaction to the operation is generally moderate enough so that within five days the patient is able to wear a temporary shell prosthesis, attached to the cap of the implant by means of dental wax. It is considered desirable to have the patient use such a prosthesis early, in order to obviate development of adhesions along the muscle sheaths. Early movement is as important here as it is in the presence of fractures or tendon strains. After the pressure bandage has been removed, saline irrigations should be carried out twice daily, in order to assure adequate drainage of the cul-de-sac and to discourage infection. Should unusual redness, irritation or other signs of infection be present, antibiotics should be used, both locally and generally. Some surgeons prefer to use these routinely as a preventive measure.

COMMENT

Since it was obvious that this implant should be light, durable, and strong, thin plastic material was used. A disagreeable feature of some of the older implants, such as those made of glass, was that occasionally they exploded within the orbit, a danger not existent when plastic is used. However, important in the use of a plastic in the body is the necessity that it be nontoxic, hence properly "cured." Many of the large implants of plastic were solid and proved unsatisfactory because it was difficult to "cure" them properly, so that formaldehyde was gradually released over a long period and acted as a source of irritation to surrounding tissues.

To achieve greater stability, fenestrations have been so placed that there is opportunity for ingrowth of fibrous tissue within the implant.

Another important specification for this implant was that the transfer of energy to the prosthesis should be immediate and rigid, yet the two portions should be separated easily for cleaning. Furthermore, the attachment was designed to provide an automatic release against excessive

Acrylic plastic implant described in text.

muscle strain. As can be seen, attachment to the prosthesis is by a floating wedge, which, when the attachment is direct, is efficient in the transfer of energy, yet, allows for slipping on overload.

The size of the implant was determined on the basis of avoiding pressure atrophy of the muscles where they are attached. Furthermore, it was apparent that one of the reasons for the failure of other implants has been pressure atrophy of the muscles or their tendons as a result of inadequate blood supply. In this implant, apparently, the blood supply is excellent, since the muscles are attached to each other and each carries its own artery.

It is important that there be an even distribution of the weight of the implant and prosthesis over a wide area, to avoid pressure atrophy of the muscles and orbital tissues. Essential, too, is protection of the conjunctiva against pressure atrophy, a causative factor more responsible for extrusion than any other. With this implant, such pressure is obviated by the protecting flange of the implant cap.

Weight must be removed from the lower lid, since it cannot tolerate much strain without becoming liable to sag and ectropion. With this implant, weight is not carried exclusively either by the extraocular muscles or by the lid, but is distributed evenly between the two.

Of importance from the standpoint of size and motion of the prosthesis is preservation of the conjunctival cul-de-sac to allow for the volume of the artificial eye. When an implant is buried, the conjunctiva is shortened by the amount used to close the wound; hence there is a reduction in the depth of the cul-de-sac. With this implant, the limbal edge of the conjunctiva is sutured around the neck, so that there is no material loss.

There are also functional requirements that must be considered in the develop-

ment of implants. First, there must be direct contact with the prosthetic appliance itself, as in this instance by a floating mechanism. Second, there must be adequate motion, which involves no lag in fine, rapid movements; that is, the artificial eye must move instantly and with the same speed as the other eye. Motion must be confined to the size limits of the prosthesis, as it must cover all the area behind the lids. A defect is often observed if motion temporally is too great, since the medial extent of the prosthesis cannot be allowed to be so great as to dig into the inner canthal ligament on medial rotation. The restriction of motion inherent in a prosthesis limits the requirement of motion in the implant. An amount beyond this is therefore wasted, and from the standpoint of permanence or tolerance may be dangerous. For these reasons, shortening of the extraocular muscles by overlapping inside the implant, with consequent slight reduction in the extent of motion, was not considered an undesirable sacrifice. Third, in a good implant, in which the weight is well distributed between the extraocular muscles and the lower lid, development of a sunken area below the upper orbital rim is not likely.

Last, and not to be overlooked, is the problem of expense. For this type of implant no custom-built eye need be made. Stock eyes, as represented by the American Optical Company's "monoplex eye," are easily adapted to fit. A mated cross with proper ridges to fit the anterior surface of the implant cap can be attached easily to the back of the prosthesis in such a position as to center the cornea with that of the other eye.

SUMMARY

A new improved type of exteriorized enucleation implant is presented. It embodies the following features:

1. Lightness of weight.
2. Durability.
3. Adequacy of circulation in extraocular muscles, with protection against pressure necrosis or atrophy at point of attachment.
4. Protection of the conjunctiva from pressure contact with the prosthesis.
5. Maintenance of full depth of cul de sac.
6. Positive control between implant and prosthesis, with provision for easy automatic disengagement under strain or for sanitary purposes.
7. Satisfactory extent of motion of the prosthesis and absence of lag in initiation of motion or fine movements.
8. Division of weight load between the extraocular muscles and the lower lid for prevention of ectropion or sagging.
9. Maintenance of orbital mass.
10. Simplicity and economy in the fitting and adapting of a prosthetic eye.

SUMÁRIO

Um novo tipo melhorado de enucleação exteriorizada com implantação é apresentado. Ele comprehende os seguintes items:

1. Pêso leve
2. Durabilidade
3. Circulação adequada nos musculos extra-oculares, com proteção contra necróse de pressão ou atrofia do ponto de inserção.
4. Proteção da conjuntiva ao contáto de pressão com a protese.
5. Manutenção de inteira profundidade do fundo de saco.
6. Contróle positivo entre implantação e protese, com provisão para desengajamento automatico sob esfôrço ou por finalidades sanitarias.
7. Satisfatoria extensão de movimento da prótese e ausencia de atrázo ao se iniciar o movimento ou pequenos movimentos.
8. Divisão de carga de pêso entre os musculos extra-oculares e as palpebras inferiores para prevenção do ectropion ou quéda da palpebra.
9. Manutenção da massa orbitária.
10. Simplicadade e economia na seleção e adaptação de um ôlho protetico.

ZUSAMMENFASSUNG

Es wird eine neue Form eines nach aussen verlagerten Enukleationspfropfes eingefuehrt. Er hat die folgenden Qualitaeten:

1. Leichtes Gewicht.
2. Dauerhaftigkeit.
3. Ausreichende Zirkulation in den aeusseren Augenmuskeln mit Schutz vor Drucknekrose oder Atrophie am Befestigungspunkt.
4. Schutz der Bindehaut vor Druck durch Beruehrung mit der Prothese.
5. Erhaltung der vollen Tiefe des Bindehautsackes.
6. Kontrollierte Beziehung zwischen dem Pfropf und der Prothese mit Vorrichtung fuer eine leichte automatische Trennung bei Anstrengung oder fuer Zwecke der Hygiene.
7. Ausreichender Bewegungsumfang der Prothese, keine Verzoegerung beim Einsetzen der Bewegung oder bei feinen Bewegungen.
8. Verteilung des Gewichts auf aeussere Augenmuskeln und Unterlid zur Vorbeugung von Ektropion oder Absinken.
9. Erhaltung der Masse der Augenhoehle.
10. Einfachheit und Billigkeit beim Anmessen und Anpassen einer Augenprothese.

RIASSUNTO

Viene presentato un nuovo e migliorato tipo di protesi oculare con impianto, dopo enucleazione. Esso presenta le seguenti caratteristiche:

1. Leggerezza.
2. Durata.
3. Adeguato circolo sanguigno dei muscoli extraoculari, e corrispondente protezione contro la necrosi e l'atrofia da compressione nei punti d'attacco.
4. Protezione della congiuntiva dalla pressione di contatto con la protesi.
5. Conservazione dell'intera profondità del cul di sacco congiuntivale.
6. Controllo diretto fra impianto e protesi con relativo meccanismo per un facile sgancio in condizioni di sforzo o per scopi igienico-sanitari.
7. Soddisfacente ampiezza dei movimenti e assenza di ritardi nell'iniziare il movimento o nei movimenti più limitati.
8. Divisione del peso fra i muscoli extraoculari e la palpebra inferiore, al fine di prevenire l'ectropion o l'indebolimento dei muscoli.
9. Conservazione del contenuto orbitale.
10. Economia e semplicità nell'adattamento della protesi oculare.

RESUMEN

Se presenta un nuevo tipo mejorado para implantación enucleación exteriorizada. Comprende lo siguiente:

1. Peso liviano.
2. Durabilidad.
3. Circulación adecuada en los músculos extraoculares, con protección contra necrosis por pesión o atrofia en el punto de inserción.
4. Protección de la conjuntiva del contacto presión con la prótesis.
5. Conservación de la profundidad total del fondo de saco.
6. Control positivo entre implantación y prótesis, con provisión de desocupación automática rápida por esfuerzo o con propósitos sanitarios.
7. Extensión satisfactoria del movimiento de la prótesis y ausencia de retardo en la iniciación del movimiento o movimientos finos.
8. División de la carga del peso entre músculos oculares y párpado inferior para la prevención de ectropión o colgamiento.
9. Conservación de la masa orbitaria.
10. Simplicidad y economía en la colocación y adaptación de un ojo protésico.

RÉSUMÉ

L'auteur présente un type amélioré de prothèse oculaire après énucléation. En voici les détails:

1. Sa légèreté
2. Sa durée
3. De permettre une circulation adéquate dans les muscles extra-oculaires;

d'éviter une pression nécrosante ou une atrophie du point d'appui.

4. Une protection de la conjonctive contre la pression da contact d'avec la prothèse.

5. De tenir le cul de sac à une bonne profondeur

6. Un contrôle positif entre la prothèse et la cavité permettant de l'enlever automatiquement s'il fatigue ou s'il faut le nettoyer

7. Une mobilité satisfaisante sans délai à l'impulsion mobile

8. Répartition du poids entre les muscles extra-oculaires et la paupière inférieure afin d'éviter l'ectropion ou l'affaissement

9. de maintenir la masse orbitaire

10. Sa simplicité et son économie d'ajustement et d'adaptation d'un oeil artificiel.

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Surgery of Dislocated Lenses in Children

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AND
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PHILADELPHIA

IN the *American Journal of Ophthalmology* for September 1943,[1] we reported the case of W. L., a highly intelligent 6-year-old boy who was brought to us in 1942 and underwent an operation in May of that year for bilateral congenital dislocation of the lenses. His vision was 4/200 in the right eye and 6/200 in the left. It was slightly improved by dilatation and refraction. Both lenses were opaque and dislocated upward (Fig. 1). There was no evidence of Marfan's syndrome.

Since we are still using the same technic, this article is based on the same principle as was originally reported,[1] although the description of the technic has been somewhat clarified.

W. L. has been under our observation for nine years; we have been able, therefore, to observe not only his eye condition but his educational development. A second patient, G. S., has been closely observed for two years after undergoing an operation on one eye. His rapid visual and mental development has been just as spectacular as that of W. L. We plan to operate on the second eye in the near future.

Surgical Technic. — Discission of the lens is performed by the technic originally reported (Fig. 4). First the lens is speared with a highly curved needle from behind. The curved needle pierces the cornea at the horizontal meridian, with the curve down and the point up. The tip is jabbed into the posterior surface of the lens at the equator, and then the lens is lifted up with the least possible manipulation. The first needle is used largely to support and lift the lens. The first surgeon's hand rests on the patient's brow in a fixed position and is so maintained throughout the procedure. The second surgeon then inserts the curved needle at the opposite limbus, penetrating the equator of the lens at a point where the lens suspensory ligament would normally be attached, and a cross discission is performed, the two surgeons moving their needles in opposite directions at the same time. If the eye becomes quite soft, a straight needle is preferred for the second piercing. If the lens is only subluxated, the suspensory ligament fibers that remain are disturbed as little as possible. If the first discission procedure is not sufficient, it can be repeated two or four weeks later, and at similar intervals thereafter, as many times as is necessary. We performed it five times on one eye, with ultimate success. Dilatation is most important and must be continued throughout the treatment. Usually only mild operative hyperemia results.

In July 1942, this same surgical procedure was employed on W. L.'s left eye. *A* and *B*, Figure 2, are schematic drawings illustrating the appearance of the eyes in September of the same year. In December the condition of the eyes was as shown in Figure 3, *A* and *B* (schematic), demonstrating marked progress. At an examination one year later, with the patient looking straight ahead, no lens tissue whatever was seen. With the eye looking upward a small remnant could be found (Fig. 3*A*). Now, nine years later, it is still slightly visible at a high level.

An examination was made on April 8, 1943, when the vision, corrected (R. = + 14.00D. sph. + 2.00D. cyl. ax. 90°;

From the Eye Department, Deaconess Hospital, Marshalltown.
Read at the Sixteenth Annual Assembly of the United States Chapter, Chicago, Sept., 1951.
Submitted for publication October 5, 1951.

L. = + 13.50D. sph. + 2.00D. cyl. ax. 90°), was 20/15 in both eyes. Bifocals were being comfortably worn, and contact lenses were then fitted. During this time the patient had been undergoing intensive orthoptic training. To all appearances the eye was then normal in every respect except for aphakia, and the patient was permitted to take up his school work, which had been discontinued during the treatment. It has proved to be an ideal case of rehabilitation.

Figure 5*B* shows W. L., age 7, with his regular cataract lenses that gave 20/15 vision.

Figure 5*A* shows W. L. with contact lenses, which also gave 20/15 vision. The photograph was taken one and one-half years after the operation.

W. L. was presented in person before the Eye Section of the Assembly of the International College of Surgeons in Chicago in 1948, at a clinic at the Chicago Eye, Ear, Nose, and Throat College and Hospital. He demonstrated his regular aphakic glasses, and then the application of his contact lenses. When asked if he liked to wear them, he emphatically replied "Yes." He was asked why; his answer was, "Because I can play basketball and football, and go swimming."

Figure 6*A* shows W. L. with regular cataract glasses taken in 1951, nine years after the operation. In Figure 6*B* he is wearing contact lenses.

He is an honor student and an accomplished musician. At first he had diplopia, but after a two-year course of visual training by a competent optometrist it has largely cleared. At his last examination esotropia was still present. Prisms and orthoptic exercises are being resumed. He has 20/15 vision in both eyes and has normal eyes except for the aphakia. On ordinary examination the media is entirely clear. With the ophthalmoscope and the pupils fully dilated it is possible to see a small lens remnant when he is looking upward.

Figure 7*A* a photograph of G. S. of Chicago, aged 9, the second patient presented. He was first seen two years ago. Both lenses were fully dislocated, with no zonular attachment. Vision was estimated at 3/200. His education had been delayed, and he had been going to a school for the blind. The first of a series of discissions was done on the right eye. This lens was firmer than those usually observed in children and was much slower in absorbing. Figure 7 shows this boy as he appears now. Figure 7*B* shows him wearing aphakic lenses which give him 20/20 vision. He attends regular school, and his grades are excellent. The referring optometrist and his parents have been very cooperative in the visual training procedure.

We also operated successfully on 3 children of a family of 5, all of whom had dislocated lenses, and all 3 obtained normal corrected vision.

One other case is briefly reported: A 16-year-old boy with Marfan's cataract was seen in consultation in California. Both eyes were operated on by a competent California surgeon, who used our discission technic and reports it as fully successful.

We had a poor result on 1 eye. The patient was a 16-year-old girl with downward dislocation of the lens and questionable attachment of the suspensory ligaments. There was no relevant family history. No indication of Marfan's syndrome was present. Both eyes were operated on, and normal vision was obtained. One year later hypertension developed in one eye. Several attempts were made to control the tension surgically, but without success, and the eye was enucleated. After five years the other eye has normal corrected vision.

We have operated on 18 patients by our discission technic over a ten-year period. In evaluating the results as compared to those of the usual surgical treatment of dislocated lenses, we are led to the conclusion that this discission procedure is justified when the lenses are still juvenile or soft, largely because it avoids the loss and disturbance of vitreous. The cosmetic result is also important. With this technic we have obtained round pupils and normal-appearing eyes. Contact lenses are easily fitted.

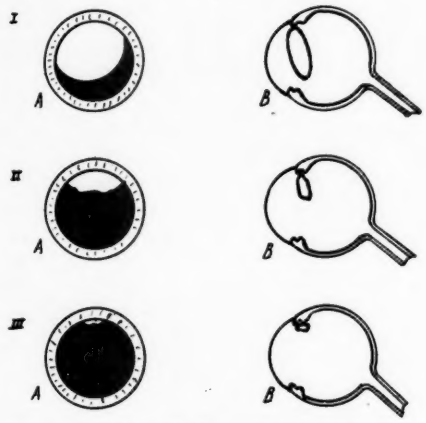

Fig. 1 (Wolfe, Wolfe and Georgariou).—*A*, appearance of right eye, with congenital dislocation of (cataractous) lens, on first examination. Full atropine dilation. *B*, schematic drawing of position of lens.

Fig. 2.—*A*, one month after second two-knife discission. Only one procedure and less lens remaining after one month. *B*, schematic drawing of relative size and position of lens residue pushed up.

Fig. 3.—*A*, appearance of both eyes nine months after surgical intervention. Normal corrected vision. *B*, schematic drawing to show relative size and position of lens residue. *(Courtesy of the American Journal of Ophthalmology.)*

It is difficult to state from our limited experience just when the lens loses its juvenile characteristics and is solid enough to contraindicate the discission technic. We feel that the lens cannot be too firm for discission in any child under the age of 12, and possibly the age limit might be somewhat further extended.

For dislocated lenses in adults we have performed the loop-spoon technic with very satisfactory results. We use a loop-spoon with the sharp tooth serations turning backward, because (1) once the lens is engaged it never slips off, and (2) delivery is made with one insertion. This one-insertion delivery minimizes disturbance and loss of vitreous, which, although undesirable, cannot be avoided in any loop delivery. Loss of vitreous seems to retard ciliary development in children and is the most important thing to be considered.

The cosmetic results with the loop are not as good as with the discission technic here reported, as loss of the round pupil cannot be avoided. This is true not only of our cases but of all others we have observed. The visual results, however, have been as good as in the cases we are demonstrating today.

COMMENT (E. B. S.)

Surgical treatment is necessary for a congenitally dislocated lens associated with the syndrome of arachnodactyly, and also in such cases as the first case presented here. Even if the lens has normal transparency, there is still a gross impairment of visual acuity—disproportionately greater for near than for distance vision, because of the great fault in the refraction resulting from the displacement of the lens. Three factors are responsible: the peripheral lenticular astigmatism in the path of the entering light ray, the

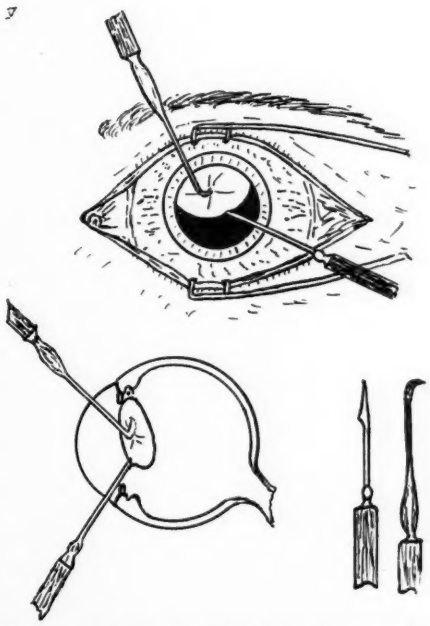

Fig. 4—(Wolfe and Wolfe).—The curved needle enters the anterior chamber at the limbus (4 o'clock). The lens is pierced posteriorly at the equator, lifted forward and fitted. A straight needle then pierces the anterior lens capsule at 9 o'clock. The lens is then slit by the second needle while it is impaled by the curved needle. *(Courtesy of the American Journal of Ophthalmology.)*

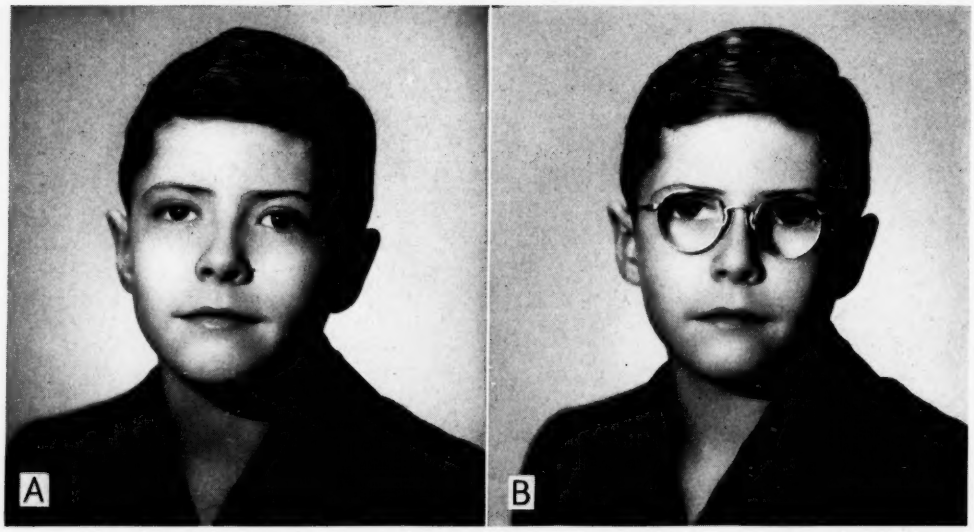

Fig. 5.—W. L., operated on for congenital (cataractous) dislocated lenses at the age of 6 years. After orthoptic exercises he obtained 20/15 vision in each eye. *A*, patient wearing contact lenses one and one-half years after the operation. He indulges in all sports. His case approaches the ultimate in surgical results in cataract therapy. *B*, W. L. wearing cataract lenses.

prism displacement to this ray from the edge of the dislocated lens, and a decrease in the actual illumination of the retinal image. Disturbances must be present, also, in the position of the principal focal points of the eye, though these are perhaps less significant.

In the past, surgical therapy for this condition has been so unsatisfactory as to justify the opinion that any surgical intervention on the lens itself was contraindicated. This conclusion seemed logical in consideration of the absolutely bad results from loop extractions, from ordinary extracapsular extractions regardless of the patient's age, and from ordinary lens discissions, sometimes followed, of necessity, by further needlings or even linear extractions.

A simple optical basal iridectomy, performed at the position of greatest subluxation of the lens is followed by good visual results and no complications whatever. The progress of some patients so treated has been followed for many years after this operation, 1 girl for more than fifteen years.

After this type of iridectomy, refraction is obtained for the aphakia, the patient using the centrally positioned path through the anterior chamber of the eye below the edge of the subluxated lens for the visual line and easily disregarding the visual line that formerly passed through the edge of the lens itself. The high convex lens permits such clear vision in an aphakic patient as compared with the blurred vision that exists when the patient attempts to use the crystalline lens-refracted pencil of light that this selection of the visual line is almost involuntary.

The surgical technic recommended in this paper seems logical in such cases.

The needle fixation of the lens, with one needle, should prevent posterior displacement of the lens and keep the anterior chamber free of prolapsed vitreous. Loop extractions and repeated ordinary discissions are almost certain to destroy the anterior hyaloid membrane and are thus largely responsible for the almost inevitable degeneration of the globe that develops several years later, supposing that the eye recovers from the operation without immediate postoperative phthisis bulbi.

Also, discission of the lens nucleus at the equator of the lens early in life and at a time when there is but little lens cortex should permit a deeper postoperative penetration of aqueous into the lens nucleus, as well as a more nearly complete absorption of the lens substance. Repeated needlings through the anterior surface of the lens are dangerous; this technic should make these unnecessary, and if another procedure is required it might be done through an anterior chamber free of vitreous. A mixture of vitreous and lens substance is not desirable.

A through-and-through lens discission is acknowledged by most eye surgeons to be dangerous. A discission at the equator, directed upward into the lens, should result in complete absorption without fear of vitreous damage. As the absorption progresses, a contraction of the remaining lens substance must occur, and with it a contraction of the capsule and lens epithelium—this all occurs upward, in the direction of the lens dislocation. The pupillary aperture should become clear early in the postoperative course, while absorption is still incomplete. This absorption must be achieved almost completely in ordinary needlings, but that is not necessary with a technic in which the pupillary clearing develops in an eccentric pattern (see illustration).

Theoretically, one comment is proper with regard to such a contracting mass of lens epithelium, lens capsule and residual lens substance. An ordinary discission has as its most common complication the development of iris-lens synechiae. These occur from plastic exudates and as a result of contact between the lens masses and the posterior surface of the iris, and result in contraction of the pupil due to adhesions. It is quite possible that this type of discission, as done at the lower lens equator, will minimize the probability of that sequence of events to a considerable extent. It is doubtful whether the resid-

Fig. 6.—*A*, W. L. nine years after the operation, with regular cataract glasses. Normal vision, *B*, W. L. nine years after the operation, wearing contact lenses. Normal vision. Slight esotropia. Complete visual rehabilitation.

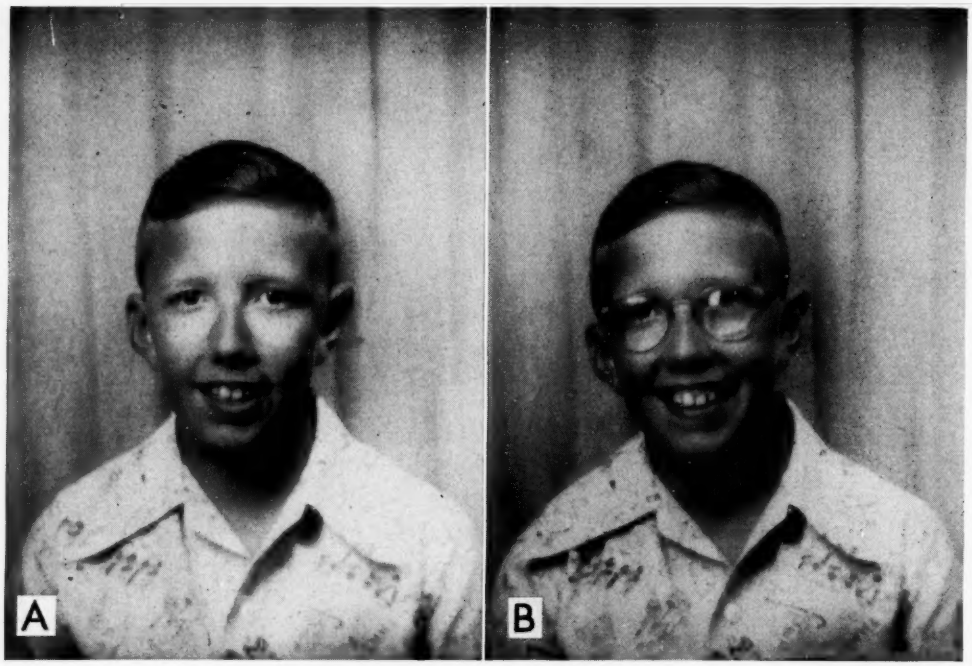

Fig. 7.—*A*, G. S. as he is now. Operation on left eye will be performed in a few months. Full visual rehabilitation of right eye. *B*, G. S. with regular cataract lens. Right eye, 20/20 vision. Partial occluder worn over left eye.

uals themselves are significant to later iridocyclitis or to retinal separation. This later follows vitreous damage, which must be prevented in any surgical procedure for this condition.

The technic here presented by Dr. Wolfe deserves serious consideration for patients who can be examined and operated on during childhood. Patients who have reached their adult growth should be handled otherwise. The great attention to details in the ocular manifestations of Marfan's syndrome is highly commendable.

SUMMARY AND CONCLUSIONS

The authors report successful use of their discission technic in 18 out of 19 cases of subluxated or dislocated lenses. It is suggested that this operation be considered while the lens is still soft and before subluxation has progressed to dislocation. This early approach also offers the best functional and cosmetic results and enables the formerly handicapped child to enjoy normal educational development, a point well illustrated by the school records of patients so treated.

RÉSUMÉ ET CONCLUSIONS

Les auteurs rapportent leurs succès techniques dans 18 cas sur 19 de cristallins disloqués ou subluxés. On suggère de pratiquer l'opération quand le cristallin est encore mou et avant que la subluxation ne s'achemine à la disloquation. Ce procédé prècoce offre le meilleur résultat fonctionnel et plastique tout en permettant à l'enfant handicappé de jouir d'un développement éducatif normal. Cette assertion est grandement confirmée par les fiches scolaires des patients ainsi traités.

SUMÁRIO E CONCLUSÒES

Os autôres relatam o uso de sua tecnica de separação "em 18 entre 19 casos de cristalinos sub-luxados ou deslocados. E'

sugerido que esta operação seja considerada emquanto o cristalino está ainda móle e antes que a sub-luxação tenha progredido até a deslocação. Esta indicação precóce tambem oferece os melhóres resultados cosmeticos e funcionais e habilita a criança a usufruir de desenvolvimento educacional normal, conforme é claramente ilustrado pela estatistica de pacientes assim tratados.

RESUMEN Y CONCLUSIONES

Los autores dan a conocer el uso satisfactorio de su técnica para discisión en 18 de 19 casos de cristalinos subluxados o dislocados. Se sugiere que debe considerarse esta operación cuando el cristalino es aun suave y antes de que la subluxación progrese a la dislocación. Este proceder temprano ofrece también los mejores resultados funcionales y cosméticos, capacitando al niño originalmente invalidado para gozar del desarrollo educacional normal, punto bien ilustrado por los registros escolares de pacientes así tratados.

CONCLUSIONI RIASSUNTIVE

Gli AA. riferiscono i successi ottenuti con la loro tecnica di discissione in 18 casi, su 19, di cristallini sublussati o lussati.

Tale operazione trova le sue indicazioni in quei casi in cui il cristalliano è ancora molle e prima che la sublussazione si sia trasformàta in lussazione.

Questo intervento precoce permette inoltre di ottenere i migliori risultati cosmetico-funzionali e permette ai pazienti in giovani età di seguire un normale sviluppo educativo, il che è chiaramente provato dai risultati scolastici ottenuti dai pazienti cosí curati.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Die Verfasser berichten ueber die erfolgreiche Anwendung ihrer Praepariertechnik in 18 von 19 Faellen von subluxierten oder dislozierten Linsen. Es wird vorgeschlagen, diese Operation in Betracht zu ziehen, solange die Linse noch weich ist, und bevor eine Subluxation in eine Dislokation uebergsht. Dieses fruehzeitige Vorgehen bietet auch die besten Aussichten fuer gute funktionelle und kosmetische Ergebnisse und befaehigt das vorher behinderte kind, ein normales Erziehungsprogramm abzuwickeln, was durch Schulzeugnisse auf diese Weise behandelter Kranker gut illustriert wird.

To Our Contributors Abroad

We regret to announce that under current publishing conditions it has become impossible for the *Journal* to arrange the translation into English of original articles submitted in other languages. With the single exception of articles written specifically for the *Seccion en Espanol,* which, of course, do not require translation, we must therefore request that all articles henceforward be submitted in the English language. Prompt publication can be greatly facilitated if all manuscripts are typed in double or triple space to allow room for editorial corrections. Your cooperation will be deeply appreciated.

Do's and Don'ts of Cataract Surgery

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LOOKING back over four decades of experience in ophthalmic surgery, I can recall a great many avoidable errors. To be sure, any honest surgeon will make the same admission; nevertheless, experience and study have resulted in the formation of certain general principles which, if carefully observed, will prevent a great many mistakes both of omission and of commission.

The ideal ophthalmic surgeon should be cool, calm and calculating. He should not succumb to impulse. He should be a planner, able to evaluate each case as it presents itself; and he should be broad-minded enough to admit to himself and others that he is capable of mistakes or errors in judgment.

In spite of the calculated procedure he has outlined for his guidance during an operative procedure, he should be always ready to change his mind and act accordingly, even though it is intensely embarrassing to him in the presence of associates, assistants and spectators. When unfortunate occurrences or complications arise, he should not try to ease his conscience by throwing the blame on the patient, the surgical assistant, the nurse, a spectator, or anyone conveniently at hand, but should be honest enough to accept the blame for his poor judgment or faulty technic.

The happy, successful surgeon is one who has a minimum of trouble in his operations. The goal of every ophthalmic surgeon in his cataract work should be elimination of all complications, both during and after extraction. This, of course, represents the ideal; but if one has his own principles of procedure firmly and indelibly fixed in his mind and obeys them on all occasions he is far more likely to approach this ideal than he is without such a guide. I do not suggest that all surgeons accept my list, but I do recommend that each have a list of his own.

Some years ago I formulated a list of "do's and don'ts," which on many occasions has proved extremely helpful and valuable. On more than one occasion these rules have been broken, and these slips have given me many moments of regret; moreover, they were very costly to my patients in money, comfort and sight. In this paper, therefore, I wish to pass on the results of my experience in the hope that other surgeons will be stimulated to adopt some such means of self-criticism.

Let us first take up the "do's," which are as follows:

1. Make a thorough examination before giving advice.
2. Always be sure that you are well advised as to your patient's general condition before you attempt an operation.
3. Regardless of the patient's general appearance, the absence of symptoms and the patient's insistence that he is in excellent health, insist on a thorough checkup or complete physical examination, with special attention to cardiovascular status and the blood sugar level.
4. Be sure that the night preceding the operation is a comfortable one for the patient, with complete relaxation and sleep.
5. Make sure there are no posterior synechiae in cases in which dilation is inadequate.
6. Always inspect the cornea with a slit lamp; at operation you may discover preexisting corneal dystrophy and find yourself woefully embarrassed.
7. Use oxygen piped under drapes for prevention of smothering sensations.
8. In cases of spastic entropion, cor-

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rect this annoyance before surgical measures are attempted.

9. Make sure that the lacrimal sac is clean.

10. Compress the lacrimal sac during administration of cocaine for topical anesthesia and thereby prevent postoperative nausea and vomiting.

11. Give the patient a light breakfast on the morning of the operation.

12. In case the patient has lost one eye during or after previous surgical treatment, be meticulously inquisitive concerning the details of the loss.

12. Use miotics preoperatively and postoperatively in the opposite eye, should the tension in either eye be at, near or over the upper normal limit.

13. Preparation of the field may or may not be too important, but in any event be sure of having sterile instruments. Protect the field from the respiratory blasts of patient and surgeon.

14. Think over carefully the advisability of employing intravenous anesthesia for patients who cause doubt as to their behavior.

15. Make the patient comfortable on the table. At least show some concern for his physical comfort.

16. Before introducing a needle, announce calmly your intention of making needle pricks for akinesias, retrobulbar injections and lid blebs. This also applies to superior rectus bridle suture injections, concerning which it is well to inform the patient that from this time on he will be aware of touch but not of pain.

17. If there is the slightest doubt as to the advisability of performing a canthotomy, perform one. Use hemostat crushing at the angle to prevent bleeding.

18. Keep your eyes fixed on the field of operation at all times after opening the globe.

19. If you should be so unlucky as to have a bead of vitreous present itself, release the suture lid retractors and wait. Incidentally, a knot 4 inches (10 cm.) from the distal end of the central corneal-scleral suture is a valuable addition to the security of operation, permitting quick closure. Again incidentally, keeping all sphincters which are a part of both patient and surgeon, in a relaxed state, is certainly worth while. Muscle tenseness has no place in cataract surgery.

20. In a case of prolapse of the iris, cancel all social engagements and go about the repair, not at your earliest convenience, but sooner.

21. Make dressings daily.

22. Continue the use of a protective shield during sleep for at least three or four weeks after the operation.

23. Remember that pyrabenzamine is of considerable value for anaphylactic reactions following extracapsular extractions.

24. Refer your best or closest friends for cataract operations to the best eye surgeon within flying distance. You will live longer and be much happier.

25. Instruct the patient to return every six months for complete checkup, including the eye not treated by operation.

26. Employ the method and technic of cataract extraction that you have found suits you best. Do not attempt a new procedure unless you have thoroughly convinced yourself that it is definitely superior to the one you have always employed.

27. Finally, remember that a dose of nembutal equivalent in strength to that administered to the patient, if taken by the surgeon, will often result in a quiet, orderly, peaceful operation with an excellent end result.

A few later thoughts: Try any suggestion made for elimination of epithelial invasion of the anterior chamber.

If the lens capsule ruptures, continue to use mild pressure, in order to maintain the lens in the position it had reached at the time of rupture.

A 3-mm. grasp with the capsule forceps is usually sufficient.

Remember that cortisone is a valuable adjunct in the treatment of postoperative glaucoma.

In the presence of a shallow anterior chamber, remember that the shallower the chamber, the shorter the Graefe or keratome section should be.

Be sure that there is no idle talk in

the operating room—all personnel should be quietly serious.

Be absolutely sure that akinesia is completely effective.

The list of "dont's" is as follows:

1. Do not be careless about finding out all you can about your patient.

2. Do not fail to take the intraocular tension immediately before the operation.

3. Do not plan an extracapsular operation in a case in which posterior synechiae are present or in which there is a history of recurrent inflammatory episodes.

4. Do not plan bilateral extractions at a single sitting. Postoperative complications may prove disastrous if bilateral.

5. Do not employ the "snapshot" technic in urging the patient to submit to extraction, even if immediate operation is indicated.

6. Do not show any signs of glee when you discover, on examination of the patient, that you are dealing with an operable cataract.

7. Do not forget that friendliness and kindness give invaluable sedation for your patient.

8. Do not overlook the importance of advising surgical intervention if the cataract is hypermature, regardless of the fact that vision in the opposite eye is 20/20 or slightly less.

9. Do not be too optimistic concerning the outcome of the proposed operation. Furnish your patient with your estimation of the chances of obtaining a good result, based on the patient's age, previous experience, physical condition, etc.

10. Do not set a date for operation unless you can be sure of meeting it. Waiting for the "go" sign for a surgical date is no fun for the patient.

11. Do not neglect the niceties that should accompany the admission of the patient to the hospital. See that he has attention on that occasion and that something definite is done for him immediately on his arrival. It will give him confidence that all will be well.

12. Do not permit any talk in the operating room unless to the patient and in a low conversational tone. Avoid conversation even with the patient except by the anesthetist, surgeon and nurse.

13. Do not coach the patient or give him instructions as to his behavior.

14. Never announce to the patient that the operation is under way.

15. Don't forget that hydase is the most recent valuable adjunct in vitreousless extractions.

16. Do not attempt an extraction if you suspect that even a mild degree of retrobulbar hemorrhage has occurred.

17. Do not make the section if there is protrusion of the globe or limitation of voluntary motion. If in doubt, fix the eye at the limbus and test rotation in all fields.

18. Do not deny yourself the comfort and safety of lid sutures instead of a speculum. They add to safety and security.

19. Do not start to make a section unless you are absolutely confident of your fixation and of the effectiveness of your akinesia.

20. Do not make a section with either the Graefe knife or the keratome, enlarged with scissors, that is greater than 180 degrees. If enlarging with scissors, make no attempt to slide the male blade snugly into the angle, as this will unquestionably injure the endothelium. Slide the point along the pupillary border until you have reached the depth desired and then move the male blade laterally into the proper position. In other words, do not rigidly hug the angle with the male blade of the scissors in enlarging an incision.

21. Do not be cross or impatient, regardless of bad conduct on the part of the patient. It is much wiser to shame him subtly by complimenting him on his good behavior.

22. After the globe has been opened, do not look away from the field of operation. This is particularly important immediately after delivery of the lens.

23. Do not say "oh-oh" or "tsk, tsk," because these abbreviations mean "I wish I hadn't done that" in any language.

24. Do not whistle or hum during the operation. Personally, I should resent this type of music at my autopsy!

25. Unless you are completely convinced that, as a surgeon, you belong in

the topmost bracket, do not fish for fragments in the anterior chamber.

26. Whether the patient is rich or poor, do not attempt to deliver the lens or quiet your patient by thumping his forehead.

27. In attempting to grasp the capsule with forceps, do not "try and try again."

28. Do not attempt to deliver the lens rapidly. The slower the better, since slow delivery allows the choroidal bed to adjust itself to the reduction in support.

29. Do not attempt delivery by straight pulling or guiding. Rock the lens from side to side and guide it to and through the exit.

30. Do not attempt lens delivery through a small section opening. Conversely, do not make the section too large; 180 degrees is the maximum.

31. Do not postpone the use of vectis when applicable.

32. Do not worry about too little air being forced into the anterior chamber, but be seriously concerned if there is too much air as evidenced by a foggy, stretched cornea. Reduce the quantity of air, if too much, by iris repositor tilting.

33. In erisophake extractions, do not grasp the anterior capsule at the anterior pole. Fix the lens near the periphery, where the capsule is thicker and stronger.

34. Do not patch both eyes. With secure corneoscleral sutures, this is unnecessary.

35. Do not use atropine after an uncomplicated intracapsular delivery.

36. Do not use sandbags.

37. Do not use aspirin or empirin for postoperative relief of pain, unless they are combined with Vitamin K.

38. Do not fret about removal of the sutures. Disasters are not too rare as a result of early (eighth or tenth day) removal of corneoscleral sutures.

39. Never insist that the patient look down at the dressing. It does you no good and does the patient harm. One look at the lower half of the globe should be sufficient.

40. If avoidable, do not wrestle with a wildly disoriented patient. Send him home. Barbiturates are often the cause of this.

41. Do not send the patient home until you feel perfectly safe in doing so.

42. In dealing with postoperative glaucoma do not waste too much time with miotics, but resort to cyclodialysis as soon as possible.

43. Do not delay a repair of prolapse of the iris.

44. Do not delay an attempt to correct a flat anterior chamber.

45. Finally, do not "fiddle" before or during a cataract extraction. Or don't fiddle after the operation; don't fiddle at all. When I see a surgeon look and look and look again at the eye to be operated on, and gaze again at the eye after each and every step in the operation, inspecting his instruments at length after every move, I am convinced that (a) it is a pose, (b) the surgeon is wool gathering or (c) the surgeon has the habit of "fiddling," which is not one to enhance his surgical skill.

SUMMARY

This article deals with errors and pitfalls in the surgical treatment of cataract, which the author approaches by the "do" and "don't" method. Positive advice includes emphasis on meticulous care in examination, diagnosis, preparation and operative technic; negative advice warns against carelessness, unwise selection of patients for surgical treatment, deception of the patient, undue delay in operation, etc. Based on the author's actual experience, these observations have much practical value.

ZUSAMMENFASSUNG

Die Arbeit beschaeftigt sich mit den Irrtuemern und Tuecken in der chirurgischen Behandlung der Linsentrue bung, und der Verfasser hehandelt das Thema in der Form von "Geboten und Verboten". Zu den "Geboten" gehoert die Betonung peinlichster Sorgfalt bei der Untersuchung, in der Diagnostik, bei der Vorbereitung zur Operation und in der chirur-

gischen Technik; die "Verbote" warnen vor Fahrlaessigkeit, unkluger Auswahl der Kranken fuer den chirurgischen Eingriff, Taeuschung des Kranken, unangemessenem Aufschub der Operation usw. Diese Beobachtungen sind von grossem praktischem Wert, da sie sich auf tatsaechliche Erfahrungen des Verfassers stuetzen.

SUMÁRIO

Este artigo trata dos erros e armadilhas no tratamento cirurgico da catarata que o autor aborda pelo metodo do "proprio e do improprio". Conselhos positivos incluem realce aos cuidados meticulosos no exame, diagnostico, preparação e tecnica operatoria; conselhos negativos acautelam contra descuido, seleção inadequada de pacientes para tratamento cirurgico, decepçao do paciente, retardo indevido da operação, etc. Baseado na atual experiencia do autôr, estas observações tem muito valôr pratico.

RÉSUMÉ

Dans son article l'auteur énumère les pierres d'achoppement que l'on peut rencontrer dans le traitement de la cataracte, en expliquant ce que l'on doit ou ne doit pas faire. L'auteur énumère les soins à prendre pour un bon examen, un bon diagnostic, la préparation pré-opératoire es enfin le choix du procédé opératoire. Il insiste aussi sur le manque de précautions dans le choix des patients à opérer. Les déceptions auxquelles le patient peut s'attendre, enfin les retards inclus etc. . . Basées sur sa vaste expérience, les observations de l'auteur sont d'un précieux aide.

RESUMEN

Este artículo se ocupa del error y fracasos en el tratamiento quirúrgico de la catarata, que el autor aborda por el método de "hacer" y "no hacer". En el aspecto positivo se señalañ el meticuloso cuidado en examen, diagnóstico, preparación y técnica operatoria; en el aspecto negativo se previene contra el descuido, selección irreflexiva de pacientes para tratamiento quirúrgico, decepción del paciente, demora operatoria indebida, etc. Estas observaciones tienen mucho valor práctico, tenida cuenta de la experiencia actual del autor.

RIASSUNTO

L'articolo tratta degli errori e delle insidie della cura chirurgica della cataratta, col sistema di esporre ciò che si deve e ciò che non si deve fare.

Fra le cose da fare viene specialmente raccomandata la massima accuratezza dell 'esame clinico, della diagnosi, della preparazione e della tecnica operatoria; fra le cose da non fare vengono elencate la poca accuratezza, la malaccorta scelta dei pazienti da operare, l'illudere il malato, l'indebito ritardo nell'operare, ecc.

Tali osservazioni, basate come sono sulla viva esperienza dell'autore, riescono di grande valore pratico.

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Skin Grafting in Radical Mastoidectomy and Fenestration

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PHILADELPHIA

THE use of split thickness skin grafts in radical mastoid surgery is not new. The purpose of this paper is to recommend its more general use on the basis of its performance in about 175 fenestrations and radical mastoidectomies since October 1947 and to describe in some detail a simple technic which will insure a very high percentage of success.

Dench[1] advocated the use of Thiersch grafts cut 1½ to 2½ inches in length. These were transferred to a spatula, maneuvered into position with a needle, and maintained in situ by means of cotton pledget packs. Politzer[2] used glass rods to transfer the grafts and recommended that grafting be delayed six to twenty days after the radical operation in order to provide a more vascular bed.

According to accepted experience in skin grafting on bone, about "half take" may be obtained on diploetic bone, but as a rule the take will not be in sufficient amount to be useful.[3] A split thickness graft will not take on bare cortical bone without periosteum, but if an area is small (less than 1 cm. in diameter) lateral blood supply may nourish the portion of the graft over the cortex until firm union is established to the relatively avascular base.[4] In the mastoid cavity areas of exposed cortical bone are small, and this probably accounts for success. In our experience the incidence of "take" is nearly 100 per cent in fenestration cavities but somewhat less in cases of radical mastoidectomy. This is probably due largely to the poor circulation in eburnated bone rather than to the element of contamination or secondary infection, since grossly infected areas are usually well covered if all necrotic bone is removed and the grafts are placed in contact with a vascular base.

The mechanism of "take" may be summarized as follows:

1. *Stage of Fibrinous Fixation* (after five hours).—During the first twenty-four to forty-eight hours the graft must be nourished entirely by plasma. When grafts are placed on relatively avascular bone sites this period is undoubtedly longer, but the time has not been experimentally established. It is thus evident that the thinner the graft, the more likely it is to survive.

2. *Stage of Endothelial and Fibroblastic Proliferation* (after eighteen hours to ten days, probably longer over bone).—During this phase endothelial buds from the recipient site invade the graft.

3. *Stage of Exfoliation* (after eight to twenty days).—This is a variable phenonemon. When thin grafts are used on a highly vascular base, it may be negligible. By contrast, when thick grafts are used on an avascular base, the amount of exfoliation will approach totality.

Along with reparative vascularization, there occurs a concurrent degeneration of the cells of the graft. This degenerative process is most marked in the most superficial cells of the graft, which, of course, are farthest from the underlying nourishing plasma and are the last to be reached by newly formed endothelial buds. As might be expected, when there is delay in vascularization, as is the case when grafts are placed on bone, the amount of exfoliation is considerable and closely resembles complete loss to those familiar only with the appearance of skin grafts in soft tissues. After the desquamated skin is removed, however, there appears, denuded white bone, a reddish, shiny sur-

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face produced by a very thin layer of epithelial cells at the site of the take.

It is believed that this desquamative phenomenon has discouraged many who have tried skin grafting in mastoidectomy, by giving the impression of wholesale sloughing, even in fairly successful cases. Two other factors unfavorably influencing such attempts are probably the use of grafts that were too thick and the technical problems of cutting and handling the grafts.

Many surgeons have reported considerable success with multiple pinch grafts. The objections to this method are the unsightly scarring produced at the donor site and the only partial coverage of the cavity even when there is a high percentage of takes. Lempert reported a high percentage of takes of the thinned excised segment of skin of his endaural incision. Thinned full thickness grafts with multiple fenestrations have also been used with good results. These grafts were taken from behind the ear.[5] Since there is 20 per cent failure of full thickness grafts in plastic surgery generally,[4b] it is not considered especially suitable in grafting bony cavities where the blood supply is comparatively poor.

The advantages of Thiersch grafts are the minimal necessary attention to the donor site (bandage for ten days), the complete coverage of the cavity produced at the time of operation, and the high incidence of takes. The disadvantage of thinness is not important, since there is no shrinkage in a bony cavity and no necessity to bear weight or resist trauma.

The original method of placing Thiersch grafts was to apply them to the recipient site and maintain contact by pressure dressings. Recently, methods of immediate fixation of the graft have been widely used. The method of Sano entails elaborate processing of the patient's own blood to obtain plasma (Sol A) and cellular extract (Sol B). A simpler and apparently equally effective method is the use of the patient's or commercial plasma and thrombin, or the use of thrombin alone.[6] The use of human placenta, thromboplastin, fibrin foam and fibrinogen has also been advocated.[7] I have used the thrombin method but find no advantage in its employment, since packing is required to fill the cavity in order that pressure may be continuous over the fenestra in cases of fenestration. Other observers have also found no appreciable difference between the pressure and coagulum fixation method.[6] The use of penicillin and streptomycin locally has also been recommended, especially when the recipient site is contaminated or infected.[8] The takes in infected radical mastoid cavities have been excellent when parenteral penicillin is given for one week after the operation, as is our custom in both fenestration and radical mastoidectomy.

The donor site is usually the inner aspect of the arm, because of its relatively thin skin and its accessibility during operation, but choice of the thigh or other site may be left to the patient. The donor site is practically indistinguishable from the adjacent skin after six months to a year. The inner aspect of the arm is probably also a good place to have a scar in case the knife should slip or a keloid should form. The donor site is shaved, washed with soap and water, painted with a noncorrosive antiseptic such as tincture zephrian chloride and covered with a sterile bandage the day before operation. On completion of the mastoidectomy or fenestration the arm is prepared by another application of an antiseptic and is draped.

Free Hand Method—The skin is infiltrated with 2 per cent procaine hydrochloride, and two towel clamps are applied to the skin about 2 inches (5 cm.) apart. When these are held firmly up and apart by the assistant the skin is held taut to facilitate cutting the graft. Counterpressure is made on the skin with the left hand of the surgeon, and a long straight Caltagirone skin graft knife is used to cut a free hand graft. Both the skin at the donor site and the knife are covered with a thin film of sterile vaseline before cutting is begun. The knife is passed rapidly back and forth with regular long strokes until the blade engages a thin film of skin, and the cut is continued at the same angle

until a graft about 1¾ by 3½ inches has been cut. As the cutting proceeds there may be a tendency to cut either too thin or too thick a graft. In the former instance this is compensated for by light downward pressure on the heel of the blade to cause the blade to engage more skin; if the graft is becoming too thick, downward pressure is relaxed somewhat. Deliberately changing the angle of the blade causes too great a variation in the thickness of the graft.

The ideal graft is translucent, with few or no white areas, which represent too much dermis. If the graft curls and is difficult to manage it is probably too thick. To facilitate handling, a strip of 3-inch gauze bandage is laid on the table and the graft is spread out with the raw side uppermost by means of dull instruments such as Lempert elevators. Adhesion to the gauze is facilitated by the thin film of vaseline on the surface of the graft, or lightly impregnated vaseline gauze may be used. During this process the graft is kept moist with sterile saline solution.

When the graft is uniformly spread out, it is trimmed and cut into appropriate strips, usually ½ to ¾ inch in width and 1½ inches in length. The cut is made with scissors and includes both the graft and its gauze backing. The gauze can now be picked up with the graft and handled like a postage stamp.

The grafts are applied if they were strips of wallpaper, with one narrow edge deep in the cavity, in contact with the edge of the skin flap, and the other protruding from the incision. All raw surfaces of both bone and soft tissue are covered with grafts, and they are maintained in situ by repeated layers of tightly packed parresined gauze pledgets until the cavity is filled. Overlapping of grafts is of no consequence and is preferable to leaving uncovered gaps.

It has been found highly desirable to use sufficient graft to meet the skin incision in order to prevent the formation of granulomas between the bony wound edge and the incision.

Dermatome Method—Since 1949 the Caltagirone knife has been replaced by the Brown dermatome. In this technic no fixation of the skin is needed, and the dermatome is set at 5 to produce a uniformly thin, translucent graft.

The dressing is changed for the first time on the seventh to the tenth postoperative day, with aseptic precautions. At this time the grafts are usually somewhat wrinkled but adherent at most points. No attempt is made to cleanse the cavity after removal of the parresined gauze pledgets. The cavity is not touched until the end of the second to the third week, when all loose cellular débris is irrigated out with 3 per cent warm saline solution, freshly made Sulzberger powder (0.25 per cent iodine in boric acid powder) is insufflated, and the excess powder is blown out by compressed air, only a thin frosting of powder being left. A mixture of equal parts of terramycin powder and biosorb powder is also effective in reducing the incidence of secondary infection.

The donor site is covered liberally with 3-inch petroleum gauze bandage which in turn is covered with a smooth sheet of cotton before bandaging. The dressing is removed on the tenth day, and the wound is left exposed to the air thereafter. The sites of "takes" will be found pink and smooth, which indicates the presence of a thin layer of epithelium instead of white bone or granulations at the site of incomplete takes. Small gaps in epithelialization are usually quickly covered by lateral proliferations. Occasionally a granuloma will form and must be curetted away, care being exercised to apply the curet only to the base of the granuloma. If desired, the base may be cauterized with 100 per cent trichloracetic acid.

An occasional complication is a resistant type of otitis externa, characterized by a profuse purulent discharge. This is often due to a granuloma, which will usually be found behind the posterior skin incision or superiorly in the incision. When granuloma can be excluded, a secondary infection with Bacillus pyocyaneus will usually be found to be the cause. Desquamated skin and serum make an

excellent culture medium. The object of postoperative care is to keep the ear as dry as possible, and Sulzberger powder is used because of its mild antiseptic properties and acid *p*H, which is known to be inimicable to B. pyocyaneus. When discharge is profuse and does not respond promptly to treatment, several cleansings and air drying treatments daily have been found most effective. The cavity is usually completely healed and dry by the end of the fourth week.

SUMMARY

The technic of skin grafting in radical mastoidectomy and fenestration procedures is discussed. The author summarizes the mechanism by which the graft "takes" and explains the technical steps of the operation in detail.

RESUMEN

Se discuten la técnica del injerto cutáneo en la mastoidectomía radical y los procedimientos de fenestración. Se resume el mecanismo por el cual el injerto "prende" y se explican los tiempos técnicos de la operación en detalle.

SUMÁRIO E CONCLUSÒES

A tecnica de enxerto de pele na mastectomia radical e nos processos de fenestração é discutida. O autôr resume o mecanismo pelo qual o enxêrto "péga" e explica os tempos tecnicos da operação em detalhe.

RIASSUNTO

Viene discussa la tecnica degli innesti cutanei nelle mastoidectomie radicali e nelle fenestrazioni.

L'autore espone il meccanismo d'attecchimento dei trapianti e spiega dettagliatamente i vari tempi dell'intervento.

RÉSUMÉ

On discute le procédé de greffe cutanée dans les cas de mastoidectomie et de fenestration. L'auteur résume le mécanisme de cicatrisation de la greffe de même que les étapes de l'opération.

ZUSAMMENFASSUNG

Die Technik der Hautplastik in Faellen von radikaler Warzenfortsatzresektion und Fenesterungsverfahren wird eroertert. Der Autor gibt eine Zusammenfassung des Mechanismus, mit dessen Hilfe der Hautlappen "sich einwurzelt" und erklaert im einzelnen die technischen Schritte der Operation.

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SCIENTIFIC EXHIBITS

Those desiring to present scientific exhibits at the 1952 National Assembly of the United States Chapter, International College of Surgeons, to be held on September 2 to 5 inclusive at the Conrad Hilton Hotel, Chicago, are requested to communicate with Dr. Arnold S. Jackson, Madison 5, Wisconsin. Full details will be supplied on request.

Marfan's Syndrome

Ectopia Lentis With General Deformities

RICHARD A. PERRITT, M.D., F.I.C.S.
CHICAGO

ECTOPIA lentis is observed in persons with generalized deformities of growth, such as dwarfism, and is associated also with skeletal deformities, the most typical of which is arachnodactyly. Since Marfan's original report in 1896, 325 cases have been reported.

Dystrophia Mesodermatis Congenita (Marfan's Syndrome.)—This condition is congenital and is characterized by widespread aberrations in the mesodermal tissues and abnormalities of the heart.

The main characteristics are elongation of the long bones, especially of the hands and feet, spinal curvature, a dolichocephalic skull, underdeveloped muscles, flat feet, hammer toes, absence of subcutaneous fat, infantilism and a high-arched palate. In about 40 per cent of patients there are anomalies of the lids and lashes, bilateral ectopia lentis and tremulous irises. Some patients have nystagmus and congenital miosis. The iris stroma being atrophic, the pupil fails to react to atropine.

This condition shows a *strong hereditary tendency* affecting both sexes. The cause is unknown but is presumably some deleterious chemical influence acting at an early embryonic stage, which inhibits mesodermal development not only in the eyes but widely over the body.

Ralph I. Lloyd has stated that dislocation of the lens and rigidity of the iris are *progressive* in some patients. In some there also develops uveal degeneration, ending in detachment of the retina.

The disease is a dominant hereditary condition in many families; in others it

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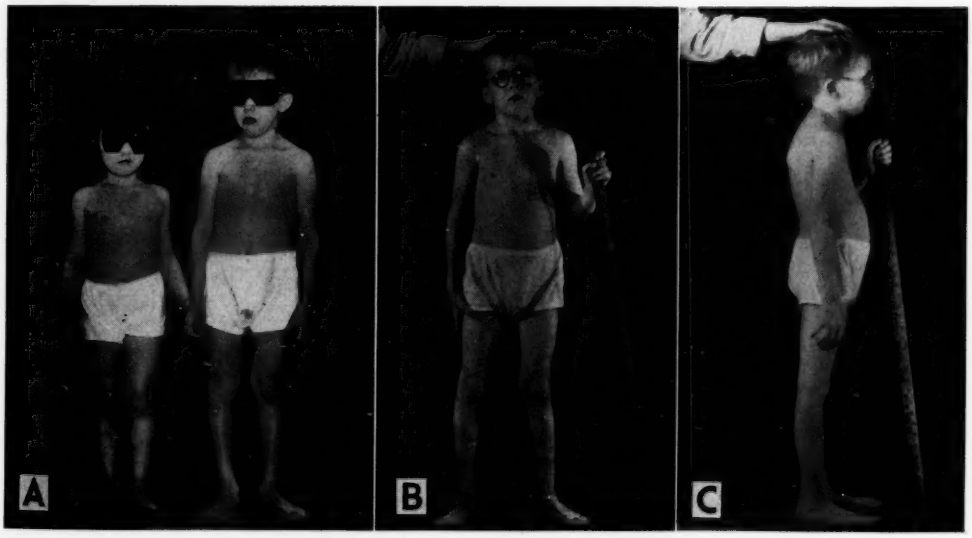

Fig. 1.—*A*, normal 4-year-old girl (left) and abnormal 3½-year-old boy (right) with Marfan's syndrome. *B*, anterior and *C*, lateral views of abnormal boy.

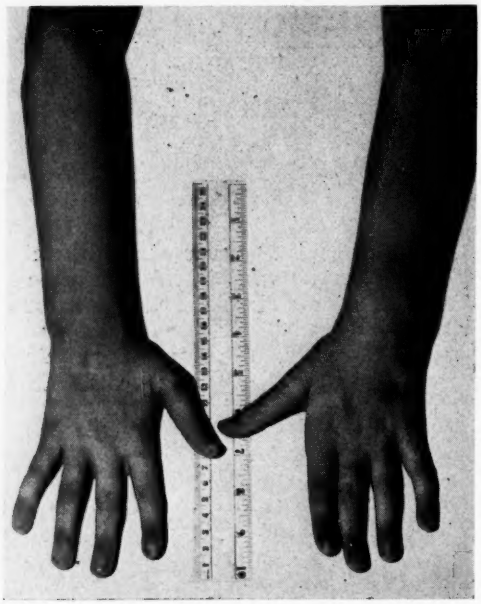

Fig. 2.—Hands and wrists of boy with Marfan's syndrome (same patient as in Figure 1).

is recessive. It is not unusual to find some of its features in a parent, one of whose children has all the typical defects; another, the typical hands and feet only, and still others who are normal or thin and tall. The arachnodactylic infant may be as plump as the normal child, showing no abnormality beyond dislocation of the lens and abnormal flexibility of some joints. Such a child grows tall and very thin. The feet are so long and narrow that it is difficult to find shoes that fit. The youngest child I have seen with this defect was 5 months of age; the defect was considered congenital. The dislocation of the lens was symmetrically upward and outward. (This is observed in all cases, almost without exception.)

There has been a great deal of controversy as to whether needling is better than removal of the lens in its capsule. Lloyd has pointed out that it is not the type of operation employed that explains the poor results, but the kind of eye the surgeon is dealing with.

Spaeth has suggested iridectomy to expose a lens-free area. If iridectomy is not done, prolapse of the iris may follow. Quite often pigment granules are seen on the vitreous strands and even in the fibers of the suspensory ligament; the spastic iris becomes atrophic and rigid and therefore does not respond to atropine. In this stage, slight accidents cause retinal detachments that may exist far forward, unobserved and difficult to detect because of the small, rigid pupil.

Ectropia lentis is frequently difficult to treat by needling without unless it is fixation by a second needle (knife needle). An alternative method is the use of the Bell erisophake. Dr. Otis Wolfe of Iowa uses the ingenious method of fragmentation, and suction.

Case Observations.—The cases of 2 children with Marfan's syndrome are representative. Both the father and the grandfather were similarly afflicted.

K. K. was operated on at the age of 2 years. Multiple needlings (4) were performed. The boy's approximate vision was 20/50 for each eye, with correction.

B. K. was first seen at the age of 5 months. The diagnosis was congenital dislocation of both lenses. There was an asymmetric defect in the zonules, and the lens was displaced upward and outward. The edge of the lens appeared as a dark crescent by reflected light; by transillumination through the sclera it appeared as a bright crescent. Ophthalmologic examination was interesting, because reduplication of the optic disc was seen.

The right eye was needled. Two weeks later, corneal section and intracapsular lens extraction were performed. Vision in the right eye, with correction, was 20/30 on the illiterate chart.

The left eye was needled, with lens extraction two weeks later. The patient had an accident in the hospital; there developed what was probably a retinal detachment, and enucleation became necessary.

SUMMARY

The author reports case of Marfan's syndrome in the same family. The patients were children aged 5 months and 2½ years respectively. The condition, of

Fig. 3.—Anterior *(A)* and lateral *(B)* views of feet of boy with Marfan's syndrome (see Figures 1 and 2).

unknown cause, involves various physical anomalies which show a strong hereditary tendency. In 1 case reported, enucleation of the left eye was ultimately necessary as the result of an accident.

ZUSAMMENFASSUNG

Der Verfasser berichtet den Fall eines dreieinhalbjaehrigen Knaben mit Marfans Syndrom. Die Erkrankung, deren Ursache unbekannt ist, umfasst verschiedene koerperliche Anomalien, die eine starke Neigung zur Vererblichkeit zeigen. In dem vorgestellten Falle war schliesslich die Enukleierung des linken Auges notwendig.

RÉSUMÉ

L'auteur rapporte un cas du syndrôme de Marfan où le patient était âgé de 3 ans ½. L'étiologie, inconnue, le syndrôme comporte plusieurs malformations congénitales. Dans le cas particulier, il a fallu enlever l'oeil gauche.

RESUMEN

Se da a conocer un caso de síndrome de Marfan en un niño de tres años y medio de edad. El estado patológico, de causa desconocida, comprende varias anomalías físicas que muestran una fuerte tendencia hereditaria. En el caso de que se trata, la enucleación del ojo izquierdo fué al fin necesaria.

RIASSUNTO

L'A. riferisce un caso di sindrome di Marfan osservata in un bimbo di 3 anni e mezzo.

Tale condizione patologica, di etiologia ignota, è costituita da varie malformazioni a forte tendenza ereditaria.

Nel caso descritto fu necessaria l'enucleazione dell'occhio sinistro.

SUMÁRIO

O autôr relata o caso de um sindrome de Marfan no qual o paciente era um menino de 3½ anos de idade. A condição, de causa desconhecida, envolve varias anomalias fisicas que mostram uma fórte tendencia hereditaria. No caso relatado, a enucleação do ôlho esquerdo foi ultimamente necessaria.

There is less danger from a disease which is proper to the nature, condition and age of a patient, or to the time of year, than if it be not proper to one of these.

—Hippocrates

Superficial Keratectomy

A Technic of Corneal Resection for Restoration of Vision With Use of Binocular Dissecting Microscope

RICHARD A. PERRITT, M.D., F.I.C.S.
CHICAGO

SPECIFICATIONS on the special microscope used in this work are as follows: working distance, 5½ inches; depth of focus, plus or minus 0.27 mm.; focal length, 1.7 × objective, 59.3 mm.; field coverage, 25.4 mm., and magnification, × 7.

There are four types of resection: (a) optical; (b) therapeutic (large central scar with tendency to recurrent ulceration); (c) cosmetic (removal of dense, white, extensive and disfiguring scars), and (d) amelioration of the cornea for subsequent keratoplasty.

Ever since the earliest days of ophthalmology an attempt has been to improve vision by reducing the density of corneal scars. Dionin, Jequiritol, quinine bisulfate ointment, choline chloride in 0.5 per cent solution and lately roentgen rays and Beta irradiation all have been used with this purpose in mind.

The indications for this type of surgical intervention are as follows:

1. Band-shaped keratitis. (It has been stated that large doses of viosterol and Vitamin D lead to these deposits in the cornea.) Partial superficial keratectomy is particularly successful in the treatment of this type of corneal opacity, especially if other keratoplastic procedures involve greater risk to the patient, as they do, for example, to a monocular patient with aphakia.
2. Fatty infiltration of the cornea.
3. Calcium plaques of the cornea.
4. Dystrophies of the cornea.
5. Extensive corneal opacities with pannus formation.
6. Thick, dense leukomas that do not involve Decemet's membrane. A superficial keratectomy reduces the thickness and improves the bed. Secondary opacification is not as dense as the original leukoma. It may also be advantageous to perform preliminary iridectomy.
7. Trachomatous infection of the cornea and complete superficial vascularization.
8. Carbide explosion causing superficial but complete opacity of the outer layers of the cornea.
9. Lime burns of the cornea.
10. Acid burns of the cornea.
11. Other chemical burns of the cornea.
12. Explosions producing superficial opacities interspersed with multiple foreign bodies.
13. Corneal opacities due to tear gas.

The contraindications for this type of intervention are:

1. Active inflammation either due to disease or following trauma. No corneal operation should be considered until this subsides—a matter of six to twelve months. There must be no evidence of photophobia, lacrimation or blepharospasm.
2. The glaucomatous state.
3. Extreme nervousness and lack of cooperation on the part of the patient.
4. Extensive sensitivity to ophthalmic drugs.

A careful and thorough examination

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with the biomicroscope and slit lamp is a prerequisite to determine:

1. Irregularities and differences in thickness of the corneal scar or scars.
2. Exact location of the layers of the cornea.
3. Degree, extent and localization of the vascularization.
4. Condition of Decemet's membrane (deposits, irregularities, precipitates).
5. Condition of underlying structures as determined by transillumination and stereoscopic infra-red photography.
6. Evidence of synechiae, anterior and posterior.
7. Preoperative and postoperative use of irradiation (roentgen ray and beta).

In all cases of vascularization of the cornea, preoperative irradiation is desirable. Postoperative irradiation should be done within forty-eight hours after the operation. It is most successful at this time because new-formed blood vessels are more readily obliterated. Successful roentgen and beta irradiation depends on *adequate* dosage.

Technic. — The binocular microscope with its co-ordinated spotlight is suspended on a horizontal bar and adjusted over the patient's head. The proper focal distance found (usually 5 or 6 inches [12.7 to 15.2 cm.] from the eye) before sterile preparation of the patient. Instillation of 4 per cent cocaine is followed by perilimbal subconjunctival injection of 4 per cent procaine hydrochloride and epinephrine 1:1,000. If the scar is vascular, instillation of neosynephrine hydrochloride in 10 per cent solution prior to subconjunctival injection will control bleeding, enhance the anesthetic effect of the procaine and dilate the pupil. The entire instrument is then draped with a specially adapted sterile covering and once more placed over the patient.

With a modified guarded Lancaster knife or a No. 15 American safety razor blade that fits into a Bard Parker handle, a cruciate incision is made, the cross meeting about 3 mm. to either side of the pupillary zone. This is done so that dissection of the pupillary zone may be relatively smooth and regular. The depth of the incision is determined by preliminary study of the thickness of the cornea—normally the adult cornea is about 1 mm. thick in the periphery and slightly less in the center. In older persons it becomes slightly thinner. I have seen leukomatous corneas between 2 and 3 mm. thick.

The apex of one of the four quadrants is then picked up with a thin, sharp hook. The hook is used to engage the full thickness of the flap. This is done by placing the hook in the groove of the cut with the handle perpendicular to the surface of the cornea and engaging the bottom of the apex of the segment to be removed. The apex is lifted and traction made so as to form a line of cleavage. The knife must be held properly. The portion of the blade *near the tip* is used. (It may be necessary to use two American safety razor blades before completing the operation, because they must be *razor sharp.*)

The blade is held parallel to the corneal surface and tilted very slightly *upward.* A to and fro motion is used, and one should always remember *never to cut toward the underlying corneal surface.* As soon as sufficient cornea has been dissected away, the hook is replaced by a small jeweler's forceps. The rest of the dissection is continued and easily done, always in the same line of cleavage until the limbus is reached and the quadrant then excised. If there are any deep corneal vessels at the limbus, under the direct view of the microscope, a very fine electrode can be placed *within the lumen* of the vessel and electrodesiccation performed.

If the iris and the pupillary margin are not readily discernible after instillation of physiologic solution of sodium chloride, and instead there is a milky appearance, it means either that the initial incision has not been deep enough or that the scar tissue has infiltrated the entire thickness of the cornea.

If more of the corneal scar is to be removed, this is the point at which the corneal hook has its greatest advantage—

I then carefully press down and indent the portion to be excised, engaging the point of the hook, and dissect off a few more layers, using the knife blade as previously described.

If the opaque area is band-shaped or limited to a portion of the cornea an incision is started in clear cornea a few millimeters beyond the limit of the scar, parallelling the side of the scar to the limbus. A similar incision is made on the other side. If it is sector-shaped the first incision crosses the second and an apex is formed. Dissection is carried on as previously described.

With the operation completed, 1 per cent atropine sulfate or 0.33 per cent scopalomine hydrobromide is instilled and both eyes bandaged. The progress of epithelization can be followed by the use of fluorescine. It is usually complete in about ten days. On the first postoperative day and every day thereafter, I use stimulative doses of ultraviolet, which stimulates epithelial regeneration and produces a good clean wound. Other postoperative therapeutic measures are:

1. Water-soluble aniline red, 1 per cent, administered as drops.
2. Choline chloride, 0.5 per cent solution, administered as drops.
3. Epinephrine 1:1,000 if there is a tendency towards bulging. This is instilled three to four times daily from four to six weeks and is of great help.
4. Hyaluronidase, 250 TU, administered as drops for six to nine months, while the cornea continues to clear. This stimulates and increases the metabolism of the cornea.
5. Beta irradiation if the cornea is very vascular. This is started on the first postoperative day and repeated every two weeks if necessary.

Complications.—If the cornea is punctured during the initial incision I suture it end to end, instill 1 per cent atropine and place a modified Wheeler dressing. The chamber usually reforms in twenty-four hours and no complications result. If the anterior chamber is opened during dissection of one of the quadrants, I do not remove that section of the cornea but allow it to heal for several months and dissect it at a later date.

Decemetocele may occur follow too extensive or too deep a resection of corneal parenchyma, or it may occur after an operation on an already thinned cornea. In the early stages this complication can be treated by daily use of epinephrine 1:1,000 and modified Wheeler dressings. If this does not prove effective, the treatment of choice is a penetrating corneal graft.

SUMMARY

The author presents a technic of corneal resection for the restoration of vision, in which the binocular dissecting microscope is employed. Among the indications are "band-shaped" keratitis, fatty infiltration of the cornea, calcium plaques of the cornea, corneal dystrophies, trachomatous infection of the cornea, chemical burns, etc. Possible complications and their treatment are discussed.

SUMÁRIO

O autôr apresenta uma tecnica de resecção cornea para restauração da visão, na qual a dissecção binocular microscopica é empregada. Entre as indicações estão a queratite "em forma de mão," infiltração adipósa da cornea, placas de calcio da cornea, distrofia da cornea, infeção trachomatosa da cornea, queimaduras quimicas, etc. Possiveis complicações e seu tratamento são discutidos.

RIASSUNTO

L'A. presenta un metodo di resezione corneale mirante al ripristino del visus, in cui viene impiegato un microscopio binoculare da dissezione.

Fra le indicazioni operatorie di tale metodo vi sono la cheratite "a forma di mano," l'infiltrazione adiposa della cornea, le placche calcifiche della cornea, le distrofie corneali, le infezioni tracomatose, le lesioni chimiche ecc.

Vengono infine discusse le possibili complicazioni e la loro cura.

ZUSAMMENFASSUNG

Der Verfasser beschreibt eine Technik der Hornhautresektion zur Wiederherstellung der Sehkraft, wobei das binokulare Praepariermikroskop zur Anwendung gelangt. Zu den Indikationen gehoeren die "handfoermige" Hornhautentzuendung, die fettige Infiltration der Hornhaut, Kalkplaettchen der Hornhaut, Ernaehrungsstoerungen der Hornhaut, trachomatoese Infektionen der Hornhaut, chemische Veraetzungen usw. Moeglicherweise auftretende Komplikationen und deren Behandlung werden eroertert.

RÉSUMÉ

L'auteur présente sa technique de résection cornéenne pour restorer la vision où l'emploi du microscope binoculaire est nécessaire. Les indications sont, la kératite, l'infiltration graisseuse de la cornée, la calcification de la cornée, les dystrophies de la cornée, le trachome infecté de la cornée, les brûlures chimiques etc. . . Les complications éventuelles avec leur traitement sont aussi discutées.

RESUMEN

Se presenta una técnica de resección corneal para restauración de la visión, en que es empleado el microscopio de disección binocular. Entre las indicaciones se encuentran queratitis "maniforme", infiltración grasosa corneal, placas cálcicas corneales, distrofias corneales, infección tracomatosa corneal, quemaduras químicas, etc. Se discuten las posibles complicaciones y su tratamiento.

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Electrocoagulation of Tonsils

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THE removal of tonsils by electrocoagulation has been a controversial subject for more than twenty years. Extravagant claims by certain enthusiasts who hailed it as the ideal method of tonsillectomy have been bitterly opposed by those who denounce it as a method utterly devoid of merit.

Much of this criticism was justified, and a great deal of antagonism to the method was aroused by the sales methods employed by the makers of diathermy machines. The majority of the sales were made to men without training or surgical experience in throat work. They were led to believe that a diathermy machine was all they needed to remove tonsils safely, efficiently and without bleeding or pain. It goes without saying that the results were poor in most cases. Sore throats, hemorrhages and incomplete tonsillectomies were the rule rather than the exception. For this and other reasons the method was condemned. Quite a few throat specialists, however, remained of the opinion that electrocoagulation did have merit and would be a valuable adjunct in their practice if properly used in certain types of cases.

I started to use this method of tonsil removal about twenty years ago and have continued its use ever since.

The indications for the removal of tonsils by electrocoagulation are limited. Its potentialities lie in the treatment of the elderly patient with a focal infection in the tonsils which is a serious menace to his health. Most of these older patients are in poor health generally. The combination of age and poor physical condition makes them a poor risk for surgical tonsillectomy. Their convalescence is usually slow and often associated with various complications. It is my opinion that in such cases electrocoagulation is the method of choice. The patients remain ambulatory; their eating and sleeping habits are but slightly disturbed, and there is a minimum of pain and bleeding if the method is properly used.

The second indication is a minor one and applies to the patient who is afraid of surgical treatment and will not consent to surgical removal. These patients will, however, permit removal by electrocoagulation.

The third indication is for patients with tonsil stumps due to incomplete tonsillectomy. In most of these cases electrocoagulation is the method of choice. The exceptions are those cases in which the piece of tonsil is large and bound down with scar tissue and adhesions; in such cases the surgical approach is preferable.

The technic of removing tonsils by electrocoagulation is simple, but it is also painstaking and exacting. Any deviation from the proper procedure will give poor results. As is well known, this is a fractional removal in which a small part of the tonsil is destroyed at each treatment. It is an office procedure, and the patient is ambulatory. Only one tonsil is coagulated at a time, and the treatments are spaced one week apart. In this way, whatever soreness is present is confined to one tonsil at a time. Only enough current should be used to achieve complete dehydration of the area of tonsil that is being coagulated. This results in slow destruction of the tonsil tissue, with gradual sloughing that becomes complete in about ten days.

This procedure results in little soreness and, as a rule, no bleeding; whereas, if a stronger current is used and the coagulating needle is left in contact with the tissue too long, there is more or less instant destruction of tissue, with consequent

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sloughing of a large amount of tissue in two or three days. This gives the patient a very sore throat and often results in severe hemorrhage. In such a case the very purpose of choosing electrocoagulation is defeated.

I use a bipolar electrode, slightly curved and about 3/8 inch long. The needles are inserted into the tissue slightly less than 1/4 inch. I keep the area of coagulation well separated, and find that three coagulation areas at a time represent the limit if extreme or prolonged soreness is to be avoided.

For anesthesia I use 10 per cent cocaine, applied topically. Three applications at five-minute intervals are sufficient to give adequate anesthesia. After inserting the bipolar needles I watch the surrounding tissue very carefully as the current is turned on. The instant the tissue begins to blanch, the current is turned off. Never leave the current on until the tissues become white or begin to swell.

The removal of the average pair of tonsils takes from five to six treatments for each tonsil and is spread over a period of about ten to twelve weeks.

SUMMARY

1. The removal of tonsils by electrocoagulation is a time-consuming and painstaking procedure.

2. The tonsils are completely removed by this method when the operation is performed by a competent throat surgeon using the proper technic.

3. The patients are ambulatory, and their usual living routine is seldom upset. There is little or no severe soreness, and hemorrhage is rarely encountered.

4. The removal of tonsils by electrocoagulation is not a good method for routine tonsillectomy. It is, however, of definite value in certain selected cases for older patients. In the removal of tonsil stumps it is the operation of choice in the majority of cases.

5. The method should not be condemned because it has been misused.

ZUSAMMENFASSUNG

1. Die Entfernung der Mandeln mittels Elektrokoagulation ist ein zeitraubendes und Sorgfalt erforderndes Verfahren.

2. Wenn die Operation von einem erfahrenen Halschirurgen unter Anwendung richtiger Technik ausgefuehrt wird, kommt es mit dieser Methode zur voelligen Entfernung der Mandeln.

3. Die Kranken sind ambulant, und ihr taegliches Leben wird selten gestoert. Der Wundschmerz ist gering oder nicht heftig, und Blutungen kommen selten vor.

4. Die Entfernung der Mandeln mittels Elektrokoagulation eignet sich nicht als routinemaessige Methode der Tonsillektomie. Sie ist aber von ausgesprochenem Wert in gewissen ausgewaehlten Faellen bei aelteren Kranken. Zur Entfernung von Mandelresten stellt sie in der Mehrzahl der Faelle die Operation der Wahl dar.

5. Dass die Methode missbraucht worden ist, sollte kein Grund sein, sie zu verdammen.

RIASSUNTO

1. La tonsillectomia coll'elettrocoagulazione richiede tempo e grande accuratezza.

2. Con tale metodo le tonsille vengono asportate per intero soltanto quando l'operazione è eseguita con tecnica corretta e da un abile otorinolaringojatra.

3. I pazienti possono venir operati ambulatoriamente, e raramente sono costretti a interrompere le loro occupazioni abituali. Generalmente il dolore è modico, quasi mai forte. Rara l'emorragia.

4. La tonsillectomia coll'elettrocoagulazione non è un metodo da usare abitualmente. Tuttavia è di indubbia utilità in certi casi di pazienti in età avanzata. Rappresenta, viceversa, l'operazione di scelta nella maggior parte dei casi in cui occorra estirpare monconi di tonsille.

5. Non si deve condannare il metodo solo perchè è stato usato male.

RÉSUMÉ

1. L'ablation des amygdales à l'électrocoagulation est longue et épuisante.

2. Les amygdales sont enlevées au com-

plet si le chirurgien est compétent et connait bien la méthode.

3. Le patient est ambulatoire et ne dérange pas ses habitudes journallères. Il y a peu ou pas de douleurs; l'hémorragie n'existe à peu près pas.

4. L'ablation des amygdales par l'électrocoagulation n'est pas la méthode courante à employer. Toutefois, elle a ses indications dans certains cas, surtout chez les gens lus âgés. Pour enlever des moignons d'amygdales c'est l'opérationde choix.

5. On ne doit as condamner le procédé d'emblée parce qu on en a abusé.

RESUMEN

1. La extirpación de las amígdalas por electrocoagulación es un procedimiento dilatado y laborioso.

2. Las amígdalas son completamente extirpàdas por este método cuando la operación es realizada por un especialista competente con técnica adecuada.

3. Los pacientes son ambulatorios y sus ocupaciones habituales se interrumpen rara vez. Hay poco o escaso sufrimiento y hemorragia raramente.

4. La extirpación de las amígdalas por electrocoagulación no es un buen método para la amigdalectomía rutinaria. Sin embargo, tiene valor definido en ciertos casos seleccionados para pacientes de edad avanzada. Para la extirpación de muñones amigdalinos constituye la operación de elección en la mayoría de los casos.

5. El método no debe ser condenado por el abuso que se ha hecho del mismo.

SUMÁRIO

1. A remoção de amigdalas pela electrocoagulação é processo longo e dolorôso.

2. As amigdalas são completamente removidas por este metodo quando a operação é executada por um competente cirurgião especializado, usando tecnica apropriada.

3. Os pacientes são ambulatorios e sua vida rotineira usual é raramente alterada. Ha pequena ou nenhuma dôr e a hemorragia é raramente encontrada.

4. A remoção das amigdalas pela elétrocoagulação não é um bom metodo para a tonsilectomia de rotina. E', contudo, de definito valôr em certos casos selecionados entre pacientes idosos. Na remoção de restos amigdalianos é a operação de escôlha na maioria dos casos.

5. O metodo não deve ser condenado porque sem sido usado inadequadamente.

LA PRESSE MEDICALE

La Grand Journal Français de Chirurgie et de Medicine parait chaque semaine, et donne toutes les informations scientifiques et professionelles

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Diseases of the Nose and Nasal Accessory Sinuses in Relation to the Eye

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FOR many years ophthalmologists and rhinologists[1] have observed pathologic changes in the eye, which they attributed to disease within or near the paranasal sinuses. Such conditions have been classified as inflammatory, circulatory or neoplastic.

Assuming that there is a definite connection between the nasal lesion and certain extraocular manifestations, it is best to classify and separate the definite clinical phenomena of the external eye from the less definite intraocular lesions.

Extraocular Manifestations. — Among the typical changes in the conjunctiva and the cornea are many early manifestations, either of vasomotor disturbance with inhibition of the constrictors or of parasympathetic stimulation producing dilatation of the vascular tree. Either type of vascular disturbance may result in dilated arteries and engorged veins, apparently producing transient conjunctivitis. This is the simplest manifestation of an underlying nasal factor.

The nasal condition,[2] so definitely associated with the ocular changes described, is evidently the result of several factors, based primarily upon nasal obstruction. Malposition of the septum, early infection of the ethmoid cells, enlargement of the turbinal or expansion of the ethmoid cells may result in nasal pressure and, if it continues, usually produces osteitis of the vomer.

Disturbances in the vascular system of the conjunctiva may or may not be associated with superficial keratitis. If the inflammation recurs repeatedly, keratitis may develop in one of many places on the cornea or near the corneal margin. Corneal ulcers with facets or beveled edges, tending to vascularization, are suggestive of nasal lesions.

As recurrences take place, ordinary treatment becomes less effective, and eventually these lesions of the cornea may be associated with pannus and follicular masses in the palpebral conjunctiva. This condition may become so exaggerated that it simulates trachoma; it is consistently diagnosed and treated as such. The occurrence of monocular lesions of the conjunctiva and cornea that simulate trachoma should suggest rhinologic involvement.

Berens and Nilson,[3] in their excellent study of the "relationship between the bacteriology of the conjunctiva and nasal mucosa," have established the causal relation between conjuctival and nasal infections. In their study, 50 per cent of the patients showed organisms similar in type and toxicity in both the conjunctival cultures and the corresponding nasal cultures; 43.3 per cent yielded toxic nasal cultures, and approximately 3.5 per cent yielded organisms of slightly greater toxicity in the eye than in the nose. The relation between nasal and conjunctival infections is further substantiated by clinical symptoms and pathologic signs in many cases in which nasal acerbations coincide with or are closely followed by ocular symptoms.

Inflammation of the nasal and accessory sinuses is often manifested as hyperemia and edema of the eyelid. Falk and Brunner[4] stated that edema of the eyelids associated with infection of the paranasal sinuses may be due to (1) osteitis of the walls of the sinus or (2) thrombophlebitis of the anastomosing blood vessels. If there is osteitis of the floor of the frontal sinus, the roof of the maxillary sinus or the lamina papyracea of the anterior ethmoid, the infection spreads in the adjacent soft

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tissue of the eyelid, causing edema.

Lid edema due to thrombophlebitis of the anastomosing blood vessels is more frequent. Blood vessels of the frontal sinus mucosa communicate with those of the upper lid through the vessels that pass through the floor of the frontal sinus. Blood vessels of the maxillary sinus communicate with those of the lower lid via vessels that pass through the roof of the maxillary sinus. Blood vessels of the ethmoid sinus mucosa anastomose with those of the periosteum of the orbit via vessels that pass through the lamina papyracea. The anastomosing blood vessels may carry infection from the sinus muscosa into the lids without causing changes in bone. Spreading is encouraged by the presence of many anastomosing blood vessels, e.g., in young patients.

Lid edema[5] is the most conspicuous symptom of ethmoiditis in infants and young children. Occasionally there are meningeal symptoms, which usually disappear after shrinkage of the nasal mucosa and administration of sulfonamide compounds. Operation is rarely required.

Symptoms change if infection spreads along the anastomosing blood vessels from the ethmoid sinus mucosa into the orbit. This may cause a subperiosteal orbital abscess. Exophthalmos, displacement of the eye and transitory paresis of the ocular muscles are more prominent than lid edema. Generalized meningeal symptoms are marked.

Orbital infections in infants originating in the ethmoid should be treated conservatively as long as possible, i.e., as long as meningeal or systemic symptoms or persistence of lid edema do not make operation imperative. Edema due to infection of the maxillary sinus involves the lower lid first, while that due to infection of the frontal or anterior ethmoid sinus involves the upper lid first.

Edema due to infection of the ethmoids involves the skin over the frontal process of the maxilla and extends rapidly in a lateral direction. It is localized above the internal palpebral ligament. Lid edema due to dacryocystitis involves the same area as that due to ethmoiditis but is localized below the internal palpebral ligament. Edema due to infection of the frontal sinus appears first in either the mesial or the lateral portion of the upper lid.

Inflammation of the nasal mucosa may extend into the masolacrimal duct. It may extend further in to the tear sac, producing dacryocystitis. As is well known, the tear sac and the nasolacrimal duct are surrounded by the anterior group of ethmoidal cells. Infection of these anterior ethmoidal cells may involve the tear sac. It must also be remembered that an infected tear sac may cause inflammation and infection of the anterior ethmoidal cells. Pathologic changes in or about the nasolacrimal duct are often combined with congestion of the venous plexus surrounding the duct, producing fibrosis and osteitis and finally terminating in stenosis of the duct.

Dacryocystitis with stenosis presents two distinct clinical rhinologic problems:

1. Recurrent suppuration in a fistulous tract in the operative field after total extirpation of the sac.
2. The establishment of an intranasal opening in an infected tear sac when stenosis is present in the duct below.

A fistulous wound following an operation on the tear sac is frequently the basis of repeated operations in the region of the inner canthus, the surgeon assuming that the remains of an infected sac must be present to explain the suppuration. The actual underlying pathologic condition, however, is chronic anterior ethmoiditis with secondary osteitis of the lacrimal bone. Cure will follow only as a result of complete exenteration of the anterior ethmoidal cells (especially the agger nasi cells) and those which lie lateral to and above the anterior end of the midturbinate. Operation on the tear sac has many modifications; some use the external operation with trephining of the lateral nasal wall, while others proceed only by the intranasal approach.

Both ophthalmologists and rhinologists have been sorely tried since the beginning of the century. Interest in both groups has been aroused because of the two pos-

sible approaches to the creation of a fistulous tract, the external and the intranasal. In general the ophthalmologist has favored the external and the rhinologist the intranasal approach. Numerous eminent workers in the field (West,[6] Toti,[7] Mosher,[8] Yankauer,[9] Wiener and Alvis[10]) have contributed their combined efforts and have recommended various procedures for the reestablishment of a communication between the lacrimal sac and the nose.

Functional Disturbances.—Under this heading one must consider contraction of the visual field, muscular asthenopia and diminution of the power of accommodation without ophthalmoscopic evidence of abnormality or perceptible pathologic change in the eye or orbit. Disturbances of the visual field are seen as concentric constrictions or central scotoma. When the fundus is examined and reveals no abnormality, the possibility of an abnormal field should be carefully analyzed. If after cocainization of the nasal membrane between the septum and the middle turbinate there is a marked increase in the constricted field, it is a fair indication that the constriction of the field is functional. Central scotomas usually indicate pathologic change in the papillomacular bundle, which is usually involved in the retrobulbar area. When unilateral, it indicates inflammation of the posterior ethmoidal cells and the sphenoids. An adhesion of the septum may cause constriction of the visual field and the reduction of vision to 20/200. When the synechia is broken, central vision and fields may be restored to normal.

Blepharospasm has come under my observation, as has weakness of the internal rectus muscle coincident with contraction of the visual field. In such cases the patient complains of heaviness in the head, dizziness, and even nausea, with eye strain for short periods when reading. These are the characteristic complaints of asthenopic patients.

According to most observers, orbital complications induced by the various accessory sinuses are localized in the following order of frequency: (1) the frontal sinuses, (2) the ethmoidal labyrinth, (3) the maxillary sinuses and (4) the sphenoidal sinuses.

It may be well here to discuss the role of the individual sinuses and to describe some of the chief characteristics of the orbital complications associated with infections of the accessory sinuses.

Maxillary Sinuses: Inflammatory orbital conditions due to suppurative diseases of the maxillary are particularly intense, since they owe their development chiefly to progressive periostitis following dental caries. At the onset of the orbital inflammation, swelling of the lower eyelids and chemosis of the lower part of the bulbar conjunctiva are the characteristic signs. The globe is displaced upward.

Frontal Sinuses: The orbital complications resulting from disease of the frontal sinus are usually manifest at the lower wall by the appearance of a doughy swelling, a fluctuating tumor at the upper inner angle, edema of the upper lid and downward displacement of the eyeball. The association of an orbital complication with a disease of the frontal sinus is established only after determination of the presence of the frontal sinus disease by both rhinoscopic and roentgenologic examination.

Ethmoidal Labyrinth: Here the principal sign is swelling of the medial part of each eyelid; it displaces the eyeball laterally when the inflammatory process is in the anterior part of the orbit, and laterally and anteriorly when the process is localized in the posterior part of the orbit.

lb Kjaer reported an orbital apex syndrome,[6] a rare symptom complex caused by disease of the vessels and nerves that pass through the superior sphenoid fissure and the optic foramen. The characteristic symptoms are ptosis and external and internal ophthalmoplegia, as well as impaired vision and disturbances of sensibility corresponding to the ophthalmic branch of the trigemimus. The cause of this condition is usually trauma, syphilis, tuberculosis or neoplasm. The author assumes that disease of the accessory sinuses

was the primary cause of illness. Degention and thromboangiitis of the optic nerve were explained by hematogenous propagation of the severe necrotic inflammation observed in the ethmoid and the sphenoid sinus.

Intraocular Manifestations. — Ziem,[11] more than fifty years ago, was the tween disease of the accessory sinuses and disease of the uveal tract. His supposition was that disease of the uveal tract in the presence of nasal and accessory sinus disease developed directly from disturbance of the physiologic circulation and manifested itself as passive congestion in the uvea, which brings his early observations into accord with those existing today.

Among the diseases of the optic nerve accompanying disease of the accessory sinuses, retrobulbar neuritis must be discussed. It is best to remark in the beginning that, in the view of the often minimal or hardly perceptible pathologic phenomena associated with the posterior ethmoidal and sphenoid sinus the proof of the rhinologic origin of these lesions of the optic nerve is but poorly founded. Lederer[12] stated that evidence of a causal relation between sinus disease and retrobulbar neuritis is by no means abundant. The anatomic variation between the ethmoids and sphenoids and the optic nerve in its passing through the optic foramen show some relation. Lederer cited the theory that disease of the mucosa of the sinuses may be transmitted to the optic nerve by extension or by diffusion of toxic material along the blood vessels. He expressed the opinion that more stress has been laid on the presence of infection in the sinus mucosa than on pressure on the optic nerve by the sinus walls or by obstruction of the optic foramen. More remote etiologic factors for optic neuritis should be sought even when sinusitis and optic neuritis coexist. The cause of retrobulbar neuritis given from many sources in many cases, that multiple sclerosis more than any other disease is found to be responsible for the visual disturbance associated with retrobulbar neuritis. The following factors are also to be considered as causes of bulbar neuritis: (1) toxic agents, such as alcohol, tobacco or plumbism and (2) constitutional diseases, such as syphilis, rheumatism and tuberculosis. According to Cordes,[13] skull injuries, cerebral tumors, optic atrophy and hysteria should also be included. The etiologic confusion with regard to retrobulbar neuritis arises from the fact that improvement in vision follows an operation on the sinus. It has been found that in the bony wall, in either acute or chronic disease of the ethmoid and sphenoid cells lying near the optic nerve, the incidence of visual disturbance is small.

From the foregoing discussion, therefore, it is obvious that the pathologic changes existing in most cases do not provide sufficient explanation for the occurrence of retrobulbar neuritis. In spite of the opinions expressed with regard to the causal connection of retrobulbar neuritis with hardly perceptible or quite invisible nasal changes, and in the face of the overwhelming number of publications on the subject, it must be added that often the nasal procedures are followed by improvement of vision after the shortest time interval, even in those cases in which further study excludes the rhinologic origin.

Benign and malignant neoplasms of the paranasal sinuses play an important role by invading the floor of the orbit by direct extension, producing secondary ocular complications. Tumors originating in the orbit and its adnexa may penetrate and invade the nasal recesses. Malignant lesions of the lids and the lacrimal apparatus not uncommonly invade the orbit and its contents, and may also spread and invade the ethmoid and sphenoid sinuses. Perhaps the most difficult of the malignant lesions to detect are those of the epipharynx and sphenoid which extend and invade the intracranial cavity and produce bilateral paresis of the oculomotor nerves.

In spite of the so-called manifold intimate anatomic relations between the accessory sinuses and the orbit, the number of complicating orbital disturbances is relatively small. The literature on

orbital complications following surgical treatment of the sinuses is scanty. Godtfredsen[14] reported 8 cases of his own observal in the ten-year period from 1934 to 1944, together with 42 cases gathered from the literature in thirty-two years (between 1902 and 1934). The three conditions caused by inflammation, namely, collateral edema, subperiosteal abscess and orbital phlegmon, presented the usual characteristics. A more important complication was orbital hematoma, which manifested itself by promptly developed and severe exophthalmos, with dislocation of the bulb and various degrees of subjunctival hemorrhage. The most serious complication reported was a lesion of the optic nerve due to direct instrumental damage or to long-continued stretching of the nerve in severe forms of orbital hematoma with exophthalmos. The greatest number of complications occurred after ethmoid exenteration followed by radical frontal sinus treatment. Four complications followed puncture of the antrum.

SUMMARY AND CONCLUSIONS

1. The anatomy of the nose and paranasal sinuses readily demonstrates their close relationship to the orbit.
2. It has been proved that there is a causal relation between conjunctival and nasal infections.
3. Hyperemia and edema of the lids are often demonstrated in association with infections of the paranasal sinuses.
4. Orbital abscess in the young is a common complication of sinusitis.
5. Corneal ulcers may suggest chronic infection of the antrum.
6. Central scotomas, when secondary to sphenoid or ethmoid infection, are unilateral and usually appear first in the morning.
7. The etiologic factors causing retrobulbar neuritis have not been definitely established.

It is evident from the data presented in the author's study that there is great need for a closer relation between the ophthalmologist and the rhinologist in their study of this important problem.

RÉSUMÉ ET CONCLUSIONS

1. L'anatomie du nez et des sinus avoisinants illustre bien leurs relations voisines avec l'orbite.
2. La preuve est maintenant faite de l'intercorrélation des infections de la conjonctive et du nez.
3. L'hyperhémie et l'oédème des paupières se rencontrent souvent avec une infection des sinus avoisinants du nez.
4. La sinusite chez les jeunes se complique souvent d'un abcès orbitaire.
5. L'ulcère de la cornée signifie souvent une infection chronique de l'autre.
6. Les scotomes centraux, secondaires à des infections du sphénoide ou de l'ethmoide, sont unilatéraux et matitudineux au début.
7. On ne connait pas clairement l'étiologie de la névrite rétro-bulbaire.

En conclusion, une plus étroite collaboration devrait exister entre l'ophtalmologiste et le rhinologiste.

RESUMEN Y CONCLUSIONES

1. La anatomía de la nariz y los senos paranasales demuestra desde luego su estrecha relación con la órbita.
2. Se ha probado que existe una relación causal entre las infecciones conjuntivales y nasales.
3. La hiperemia y el edema de los párpados son a menudo demostrados en asociación con infecciones de los senos paranasales.
4. El absceso de la órbita en el joven es una complicación común de sinusitis.
5. Las úlceras corneales pueden sugerir infección crónica del antro.
6. Los escotomas centrales, cuando son secundarios a infección esfenoidal o etmoidal, son unilaterales y generalmente aparecen primero en la mañana.
7. Los factores etiológicos causantes de la neuritis retrobulbar no han sido definitivamente establecidos.

Resulta evidente de los datos presentados que existe gran necesidad de una relación más estrecha entre el oftalmólogo y el rinólogo en el estudio de este problema ampliamente importante.

SUMÁRIO E CONCLUSÒES

1. A anatomia do nariz e dos seios paranasais demonstra prontamente sua intima relação com a orbita.

2. Tem sido provado que ha uma relação causal entre as infeções conjuntivais e nasais.

3. A hiperemia e o edema das palpebras são muitas vezes demonstrados em associação com infeções dos seios paranasais.

4. Abcessos da orbita na infancia são uma complicação comum da sinusite.

5. Ulceras da cornea podem sugerir infeção cronica do antro.

6. Escotomas centrais, quando secundarios a infeções esfenoidais ou etmoidais, são unilaterais e usualmente aparecem primeiro pela manhã.

7. Os fatôres etiologicos da neurite retrobulbar não tem sido definitivamente estabelecidos.

E' evidente, pelos dados apresentados em nosso estudo que ha grande necessidade de uma mais intima relação entre o oftalmologista e o rinologista no estudo deste importante problema.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Die Anatomie der Nase und ihrer Nebenhoehlen ergibt ohne weiteres deren enge Beziehung zur Augenhoehle.

2. Es ist nachgewiesen worden, dass eine ursaechliche Beziehung zwischen Infektionen der Bindehaut und der Nase besteht.

3. Hyperaemie und Oedem der Augenlider werden oft in Verbindung mit Nebenhoehleninfektionen gefunden.

4. Ein Abszess der Augenhoehle stellt beim judendlichen Individuum eine haeufige Komplikation einer Nebenhoehlenentzuendung dar.

5. Hornhautgeschwuere koennen auf eine chronische Infektion des Antrums hinweisen.

6. Zentrale Skotome sind, wenn sie im Gefolge von Keilbeinhoehlen—oder Siebbeinzelleninfektionen auftreten, einseitig und erscheinen meistens am Morgen.

7. Die ursaechlichen Faktoren, die zu retrobulbaerer Neuritis fuehren, sind noch nicht endgueltig aufgedeckt worden.

Aus den hier dargestellten Angaben geht hervor, dass beim Studium dieses hoechst wichtigen Problems eine engere Zusammenarbeit zwischen Augenarzt und Nasenarzt aeusserst notwendig ist.

CONCLUSIONI RIASSUNTIVE

1. I caratteri anatomici del naso e dei seni paranasali dimostrano la loro stretta relazione con l'orbita.

2. E' stata provata la relazione causale fra malattie infiammatorie delle congiuntive e del naso.

3. Spesso si può dimostrare l'associazione e fra stati edematosi ed iperemici delle palpebre e stati infiammatori dei seni paranasali.

4. Nel giovane, gli ascessi dell'orbita costituiscono complicazioni comuni della sinusite.

5. Ulcere corneali possono far pensare all'esistenza di stati infiammatori cronici dell'antro.

6. Gli scotomi centrali secondari a infiammazioni dello sfenoide o dell'etmoide sono unilaterali e generalmente appaiono nelle ore del mattino.

7. Non sono stati ancora chiaramente stabiliti i fattori etiologici delle neuriti retrobulbari.

Da ciò che si è detto risulta evidente che è necessaria una più stretta relazione fra oculisti ed otorinolaringojatri nello studio di tali importanti problemi.

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Ophthalmologic Developments Under Field and War Conditions

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IT has long been a popular belief that great medical discoveries are made under the stress of war, but the fact is, in all probability, that war only creates conditions in which new discoveries may be promptly applied, thus enabling surgeons to arrive at clinical conclusions in a shorter time than this requires during a peace. At all events, the diagnosis and treatment of eye conditions is unquestionably influenced by the composite war experience.

The mission of the ophthalmologic service of a field force is the preservation and care of the eyes of the personnel composing the field forces. The chief surgeon of a field force numbers an ophthalmologist among his consultants, whose main task is to provide proper eye care for large numbers of patients under field conditions. A formal ophthalmologic service is provided in higher commands only; the lower medical units provide primary first aid treatment of eye injuries. The ophthalmologist's part consists in carrying out the general mission of the medical department, thus contributing to the success of military operations by the conservation of manpower and the prevention of avoidable inefficiency in combat. This duty includes (1) recommendation of measures to protect the troops from eye injuries and disease; (2) advice as to the care of eye injuries; (3) supervision of ocular hygiene in collaboration with other medical officers; (4) procurement of ophthalmologic equipment and supplies; (5) management of proper records for future use, and (6) recommendations for the training of medical department personnel in the care of eye injuries.

In a modern army the visual requirements are stricter and the visual hazards higher than in former years. The man who drives a tank or a truck must see well. He is required to have 20/100 vision without glasses, correctible to 20/40 in each eye, although waivers may be granted in some instances. In addition to visual acuity below this minimum, there are many other causes of rejection: trachoma, chronic conjunctivitis, keratitis, corneal ulcers, corneal cicatrices and opacities, and staphyloma if sufficient to reduce vision below the standard; xerophthalmia, extensive pterygium, ectropion, entropion, lagophthalmos, ptosis, trichiasis, blepharospasm, chronic blepharitis, epiphora, chronic dacryocystitis, or lacrimal fistula. To these may be added irregularities in the form of the iris, synechiae sufficient to reduce visual acuity below the standard, progressive cataract, coloboma of the choroid or iris, absence of the pigment layers, glaucoma, iritis, extensive or progressive choroiditis, retinitis, detachment of the retina, neuroretinitis, optic neuritis, and atrophy of the optic nerve. Additional causes for rejection are nystagmus, exophthalmos, well marked strabismus, nyctalopia, diplopia, asthenopia accompanying any ocular defect, malignant tumors of the lids or eyeballs, and abnormal conditions of the eyes due to diseases of the brain.

In the theater of operations the ophthalmologist has two problems. The first is concerned with preventive treatment. If military operations are conducted in an area where trachoma is prevalent, troops must be guarded against coming in contact with infected persons. Dust conjunctivitis is frequently noted in areas in which the top soil is poor and the earth is covered with a fine layer of dust that gets into the nose, throat and conjunctival sac. Rest, boric acid washes and warm applications will result in rapid improvement in a few hours in most cases.

The second problem is that of battle

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casualties in which there are injuries of the eye or its adnexa due either to projectiles or to gas. Patients with injuries due to projectiles are given first aid and evacuated to the rear. Gas casualties are of several types, depending on the gas used. The lacrimators that may be used are chloracetophenone, brombenzlcyanide, and tear gas solution consisting of CNPS* and chloroform. The lacrimators are not dangerous to life but cause copious tearing and intense, though temporary, ocular pain. Washing with sodium bicarbonate or boric acid solution and exposure to fresh air is the treatment. The more dangerous gases are the vesicants, which produce inflammation, burns and destruction of tissue. They consist of mustard gas, lewisite and ethyldichlorarsine. Immediate washing of the eyes with boric acid or sodium bicarbonate solution is the first aid treatment.

The great impetus given to flying and sea travel has resulted in much investigative work. The ability of sailors and fliers to adapt to the dark has been measured by test lights exposed in flashes of one-fifth of a second. Gradual training has been of some aid. Exposure to the blinding flashes of powerful searchlights has diminished dark adaptability. Looking through filters of red glass or blue glass has not helped as much as was formerly believed. Visual disturbances occur in pilots in the course of flying at high altitudes, and also in power dives. Visual acuity is diminished after exposure to the beam of a searchlight. Drugs used to improve visual defects for night flying and at high altitudes are ascorbic acid and a synthetic preparation of 8-methyl-caffeine. Introducing measured doses of light into the eye is another method of increasing visual acuity. Dark filters are worn for several days prior to night flying. Anoxia has a marked effect on the function of the rod and cone layer, the optic nerve and the cerebral cortex. Decrease in ability to change the intensity of light and color is also accompanied by defective depth perception.

*CN—symbol for chloracetophenone.
*PN—symbol for chlorpicrin.

Dark adaptation studies have been given impetus by war conditions. Visual acuity, as far as darkness is concerned, may be divided into light adaptation (photopic vision) and dark adaptation (scotopic vision). Defective night vision may be a sign of vitamin A deficiency. For better efficiency in flying operations at night a well-balanced diet should be maintained, and sufficient time allowed to become dark-adapted before take-off (thirty to thirty-five minutes in moderate moonlight or darker). The peripheral visual fields should be used by looking 10 to 15 degrees away from an object instead of directly at it. Wherever possible, advantage should also be taken of contrast to assist in locating enemy aircraft.

Young patients with monocular aphakia following removal of traumatic cataracts due to combat injuries are more frequently seen. Binocular vision can be effected by fitting with contact lenses. This reduces the disparity in image size. Contact lenses are now fitted on the basis of an impression made of the surface of the eyeball. Mold materials are used. Those most commonly employed are negocoll, dental wax, Kerr's hydrocolloid, zelex and Coe-loid powder.

The association of dendritic keratitis and malaria has been noted. Epidemic keratoconjunctivitis, formerly rare, has been observed more commonly in the western hemisphere. This condition has ben known in Malaya for a long time. Its characteristic signs are sustained swelling of the lids, a sensation of foreign body in the eye, inflammation of the inner surface of the lids with formation of small white bodies (follicles), enlargement of the lymph glands of the neck and formation of small, white opacities in the cornea. Blood plasma taken from convalescent patients has a marked effect on lessening the activity of the causative agent, a filtrable virus. This possibly causes the opaque areas to become smaller.

The use of skin grafts for the correction of lid defects due to injury or disease has been vastly improved. The current technics of corneal transplantation have given better results. Released prison-

ers of war who had been subjected to starvation showed vascular lesions of the eye, amblyopia and various lesions due to lack of vitamins. Thiamin, riboflavin, ascorbic acid, nicotinic acid amide, aneurin, and other vitamin compounds were used to supplement a rich diet included in the treatment.

Chemotherapy has made great strides in the cure of ocular diseases. The sulfonamides have been used extensively in the treatment of ocular infections. Other chemotherapeutic agents are penicillin, streptomycin and the nitrofurans. They accomplish their antibacterial effect by lessening the activity of certain microorganisms. Penicillin is very effective in the treatment of severe infection of the eye. It may be used as a solution or ointment for local use, and it may be given by intramuscular injection. When used as a solution, it may be made more effective by placing it in a special contact lens connected to electric batteries, thus applying it to the infected tissue in ionized form. When it is given intramuscularly, the number of injections may be lessened by slowing the absorptive speed. This is accomplished by mixing the penicillin with peanut oil and beeswax. Thus, 300,000 units may be injected at one time for slow absorption over a period of thirty-six hours. Some of the more common microorganisms that succumb to penicillin are staphylococcus, streptococcus, gonococcus, meningococcus, pneumococcus and treponema pallida (the causative agent of syphilis). The germs producing gas gangrene (Clostridium welchii) and tetanus (Clostridium tetani) are also destroyed by penicillin. Penicillin has been injected into the anterior chamber, and intravitreally for infections of the vitreous body. Penicillin (4 drops of a solution containing 250 Oxford units per cubic centimeter) has been suggested in the prophylactic treatment of ophthalmia neonatorum, in preference to the sixty-year-old Crede method (1 drop of 1 per cent silver nitrate in each eye at birth). Interstitial keratitis has been effectively treated with subconjunctival injections of penicillin. Penicillin has also been used extensively for perforating injuries, with excellent results. Streptomycin has been effective in cases of severe infection of the lids when applied topically. The drugs of the nitrofuran series have proved to be effective chemotherapeutic agents in the presence of ulcers of the cornea.

Methods have been devised for the localization of foreign bodies that are too far forward and peripheral to be seen with the ophthalmoscope. The relation of a foreign body to the visual axis in an eye with good vision may be demonstrated with the aid of roentgen rays. If vision is lost, contact lenses may be used with a side-to-side projection, the patient fixing the good eye first on one point in front of him and then on another. Roentgenograms taken while the patient is fixing on the first point are compared with those taken while he is fixing on the second point, and the comparison is considered in making the localization. The biplane fluoroscope, which enables the surgeon to look down on the eye and through the side of the eye, has been of great help in localizing foreign bodies in the course of an operation. The electromagnet and endoscopic instruments can be used to better advantage with improved methods of localization.

No greater opportunity exists for caring for large numbers of eye patients under field conditions than in the Orient. We had the good fortune to attend the eye clinic at Shikarpur, Sind, Pakistan, as a visiting ophthalmic surgeon. During the annual period of six weeks when the hospital was open, 6,000 patients were seen and 2,500 operations were performed, of which 1,200 were for cataract.

Shikarpur is a native city of about 70,000, in the Sind Desert of northwest India. Here, during a six-week period each winter, come thousands of eye patients—many traveling as far as 500 miles by train, bullock cart or camel, and even on foot. The city is a former caravan and trade center and covers about a square mile. Sanitation is unknown, and in the bazaar food is displayed in close proximity to open sewers. Nearly all the inhabitants of Shikarpur are Hindus, but the mud-hoveled, mud-walled villages of the sur-

rounding countryside are peopled by Mohammedans. Most of these are poor tenant farmers, and they present a picturesque sight as they come to the clinic in their bright-colored rags, with their wives, children, dogs, goats and bullocks trooping after them. Nor must I forget the "hookah," or large family pipe, and the earrings, nose rings, bracelets and anklets worn by the women. The older men have long white beards and large mustaches, frequently dyed red with henna.

The hospital building consists of one small structure of four rooms: an admitting room, in which 200 patients can be seated at one time, either on the benches or on the floor; a treatment room for the postoperatively ambulatory patients, where eye medication is dispensed and refractions are performed, and two operating rooms. Each operating room has two rough wooden tables on which the patients are placed. An electric or gasoline light is held over the eye by an assistant. Cutting instruments are kept in pans of alcohol and the other instruments in pans of constantly boiling water, being removed from their position over the kerosene stoves only during the few minutes they are in actual use. The patients are kept in a large compound, consisting of evenly spaced brick pillars, over which canopies of cloth or mats are placed as protection against the rain. They lie on mats or on native rope beds called "charpais." One relative is permitted to stay and nurse each patient, and both nurse and patient are fed during the hospitalization period. Boiled rice is the main dish. The prevalence of eye diseases in this area is due to the poor vitamin content of the food and the unhygienic conditions under which the people live. Perhaps, too, the glaring rays of the sun are a factor.

The morning's work starts early and consists of dressing the bed patients and examining the new patients. Operations begin at about 10 a.m. and continue until all patients are cared for. On a single day 150 operations were performed; these included 92 for cataract. We did not finish until 7 o'clock in the evening.

In the matter of preoperative preparation, experience has shown that conjunctivitis, dacryocystitis, and pyorrhea are contraindications to cataract extraction. On the other hand, trachoma, if unaccompanied by purulent conjunctivitis, is not dangerous. Thorough irrigation with 1:2,000 mercury bichloride solution is employed immediately prior to operation, and the contents of the meibomian glands are thoroughly squeezed out. The operative results have not been worse with trachomatous patients.

A glaucomatous eye with cataract is handled by broad iridectomy, followed by cataract extraction at a later date. In performing the iridectomy, the knife is inserted 1 mm. temporal to the limbus, along the temporal superior portion of the cornea and the adjacent conjunctiva on the nasal side. The knife is not carried through the conjunctiva until the fluid of the anterior chamber leaves. In a glaucomatous eye the lens may be dislocated if the fluid of the anterior chamber escapes too rapidly. After the bleb is formed the knife is passed through and the limbus section is completed. Slight counterpressure on the sclera superior to the site of incision causes the iris to bulge, and it is then grasped with an iris forceps. First one limb is cut, and then the other, so that a wide opening may result.

The anesthetic used is 4 per cent cocaine solution instilled three times at five-minute intervals. Akinesia is obtained by infiltrating the area about the geniculate ganglion with 2 cc. of 2 per cent pantocaine. For refractory patients chloroform is used. The extracapsular extraction is performed in one-eyed patients, patients of the plethoric type, i.e., patients with bulging, large eyes, and patients with glaucomatous cataract. Patients with extracapsular extractions are dressed for the first time on the third day, and those of the intracapsular extraction type on the fifth day. Patients without complications are discharged on the tenth day.

A significant fact for the military surgeon is that, in spite of the tremendous number of patients handled under primitive conditions, the number of bad results

is no greater than with patients cared for under ideal conditions. This demonstrates that if technic is properly adjusted to field service, and if the administrative, supply and personnel features are organized accordingly, excellent results may be obtained even in the delicate procedures involved in surgery of the eye.

SUMMARY

Treatment of ocular injuries and diseases in the war arena is discussed, with an explanation of technics, emergency devices and procedures, and an evaluation of the results. Caring for large numbers of persons under field conditions is difficult but has been systematically planned. It includes not only the treatment of injuries and disease but their prophylaxis, so far as prevention is possible, and a constant study of the comparative efficiency of various remedies and devices. A brief description of the technic for treatment of a glaucomatous eye with cataract is included.

RÉSUMÉ

L'auteur discute du traitement des blessures et des maladies contractées dans une zône de guerre; explique les procédés opératoires, les méthodes d'urgence à employer et l'appréciation des résultats obtenus. Mêmes sous des conditions difficles on peut systématiquement organiser des soins médicaux pour un grand nombre dans un théatre de guerre. Ceci comporte non suelement le traitement des accidents et des maladies mais aussi leur prévention, en autant qu'on peut les prévenir. On peut aussi évaluer l'efficacité des différents remèdes et de procédés divers. On illustre aussi d'un procédé chirurgical pour le traitement d'un glaucôme associé à une cataracte.

RIASSUNTO

Viene discussa la cura delle lesioni traumatiche e delle malattie degli occhi sul campo di battaglia, con una dettagliata esposizione delle tecniche, degli espedienti e dei metodi d'urgenza, ed uno studio dei risultati.

Il trattamento di gran numero d'individui sul campo è indubbiamente difficile ma è stato sistematicamente organizzato. Il piano di cura comprende non solo la terapia vera e propria delle malattie e delle lesioni traumatiche, ma anche la loro profilassi, almeno finchè è possible, ed un costante studio comparativo dell'efficacia dei vari medicamenti e provvedimenti terapeutici.

Viene aggiunta una breve descrizione della tecnica terapeutica dell'occhio affetto da glaucoma e cataratta.

SUMÁRIO

O tratamento de traumas oculares e doenças na area de guerra é discutido, com explanação de tecnicas, intrumental de emergencia e processos, bem como a avaliação dos resultados. O cuidado de grande numero de pessôas, nessas condições especiais é dificil mas tem sido sistematicamente planejado. Inclúe não somente o tratamento dos traumas e doenças, mas sua profilaxia, tanto quanto a prevenção é possivel em um constante estudo da eficiencia comparativa de varios remedios e intrumentos. Uma breve descrição da tecnica para tratamento de um ôlho glaucomatoso com catarata é incluida.

ZUSAMMENFASSUNG

Es wird die Behandlung von Verletzungen und Erkrankungen des Auges auf dem Kriegsschauplatz eroertert. Techniken, Notvorrichtungen und Notverfahren werden erklaert, und die Ergebnisse werden ausgewertet. Die Versorgung einer grossen Anzahl von Menschen unter Kriegsbedingungen ist schwierig, ist aber systematisch ausgebaut worden. Dazu gehoert nicht nur die Behandlung von Verletzungen und Erkrankungen sondern auch, soweit das moeglich ist, deren Vorbeugung und eine ununterbrochene vergleichende Beobachtung der Wirksamkeit verschiedener Medikamente und Vorrichtungen. Die Arbeit enthaelt eine kurze

Beschreibung der Technik fuer die Behandlung eines glaukomatoesen Auges mit Linsentruebung.

RESUMEN

Se discute el tratamiento de las lesiones oculares en lo que atañe a la guerra, con explicación de técnicas, recursos y procedimientos de emergencia y evaluación de los resultados. El cuidado de gran número de personas en tales condiciones es difícil pero ha sido sistemáticamente proyectado. Incluye no sólo el tratamiento de lesiones y enfermedad sino su profilaxis, en lo que a la prevención es posible, y un estudio constante de la enficiencia comparativa de varios remedios y recursos. Se incluye una breve descripción de la técnica para el tratamiento de un ojo glaucomatoso con catarata.

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The United States Chapter of the
International College of Surgeons

announces the creation of Junior Membership in the College. The House of Delegates, meeting on Dec. 18, 1949, established this new form of membership, with the following requirements:

One year of internship in an approved hospital
One year as resident surgeon in a specific surgical training program

For further information, address

Secretary, International Board of Surgery

1516 Lake Shore Drive Chicago 10, Ill.

Otorhinologic Surgical Problems in the Biochemical Era

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NEW YORK

THE science of otolaryngology has made remarkable progress in the past few years. A little longer than a decade ago the control and elimination of severe infections was dependent almost entirely on surgery. There were no reliable drugs. With the advent of sulfonamides, penicillin, streptomycin, aureomycin, chloromycetin, and terramycin the situation of life-saving emergency operations has been largely reversed. The incidence of surgical mastoiditis, tracheotomy for acute laryngotracheobronchitis, Ludwig's angina and other surgical infectious conditions has been amazingly reduced. Despite this accomplishment, these drugs have not only left in their wake the same surgical problems but have added new clinical entities, latent mastoid infections and irreversible changes in anatomic structures resulting in impairment of hearing and even deafness. These consequences cannot be entirely attributed to the lack of effectiveness of the antibiotics. Undoubtedly more satisfactory results would be obtainable by the proper use of these agents. Their intelligent use in the treatment of surgical infections, in the light of the present information, is dependent on their employment for specific action on a known infective organism, supplemented with such local and supportive treatment and surgical measures as may be necessary.

The more common surgical procedures seem to have been little affected by the use of the biochemicals. Tonsil and adenoid operations, antral lavage, intranasal antrotomy, surgical correction of congenital and acquired nasal deformities (septectomy, rhinoplasty, removal of nasal polyps, correction of irreversible intranasal and sinus conditions) prevail without apparent reduction of incidence.

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The Caldwell-Luc, intranasal and external ethmoid and frontal sinus surgical procedures maintain their established indications. Except in the control of acute recurrent attacks of chronic sinusitis, the antibiotics promise little toward elimination of this disease and restoration of health. More often the complexity and the control of the causative factors involved in chronic sinusitis is the problem. These include local pathologic changes both congenital and acquired; infection and allergies interfering with ventilation, drainage and respiratory function; general systemic diseases and dysfunctions; habits, climate, social and home life; economic status, emotions and working conditions. A tendency to consider infection and allergy, or a combination of the two, as the sole factors to be considered in dealing with sinusitis, no doubt has limited progress in reducing the incidence of the disease. Efforts limited to the control of recurrent infections with biochemicals and by desensitization of the patient to undetermined allergens over a period of years, without recourse to effective local treatment and surgical intervention when needed, are conducive to chronic sinusitis. Not rarely one encounters young adults who have had this kind of treatment and as a result have irreversible chronic sinusitis. Progress in the reduction of this disease will be much expedited by effective treatment and correction of pathologic conditions in infants and children. During early childhood the tissue functions have not been permanently altered and are more responsive and amenable to treatment.

Myringotomy and simple modified and radical mastoid operations, though much less frequently required, are still occasionally necessary to save life. More often, however, they are needed to prevent deafness and recurrent or persistent disease.

Since acute otitis media usually responds to the newer agents, the otolaryngologist is less likely to be consulted at the outset of the disease. It is at this stage of the infection that supervision and treatment of the patient are most important in obviating the need for immediate or later surgical intervention; in the avoidance of such intracranial complications as meningitis and brain abscess, and is the conservation of hearing. This apparent prompt recovery, although the infection persists and progresses slowly in the middle ear and mastoid, provides the physician with a false sense of security, so that he does not realize his responsibility for any delayed unfavorable consequences. Because of the necessity of so vast an amount of knowledge, including chemotherapy, surgery, surgical and clinical pathology, roentgenology and contributions from other branches of medicine, to qualify one for clinical management of disease in any physiologic system, desirable results cannot always be anticipated from the treatment given by the average clinician.

As a result of indiscriminate use of biochemicals without bacteriologic diagnosis, including delayed, intermittent, inadequate dosage, improper choice of drug, changing virulence, individual resistance and individual differences of the infecting organism, the acute manifestations of the aural disease may become latent. In such instances recurrence with or without complications frequently necessitates surgical intervention.

Resolution of acute otitic infections is likely if proper treatment is instituted early. If treatment is delayed, secretory exudative inflammatory and suppurative otitis media may result, with slight or pronounced impairment of hearing and transitory aural vertigo. Later atrophic or hypertrophic changes become evident. A bulging, inflamed drum with pent-up pus in the middle ear, when not incised but left to spontaneous rupture and given improper treatment, may remain as a permanent perforation, resulting in repeated infection and hearing loss.

The treatment employed will depend on the etiologic as well as the pathologic changes present. Not infrequently, especially in adults who have experienced repeated attacks followed by incomplete resolution, the lesion is so advanced when first seen by the otologist that it may be difficult to determine the original cause. In every instance a careful study, including clinical observation, the identity of the organism, hearing and functional tests, roentgen plates of the mastoids and sinuses and a search for foci of infection of the nasopharynx, tonsils, teeth, etc., should be made. The mastoid disturbance encountered when antibiotics have been administered is often thrombosis rather than the breaking down of cells and cavitation. Less frequently destruction continues, leaving only the shell of the mastoid with a thick cortex, smooth sinus and dural plates intact.

This perhaps occurs more often than may be suspected, as the clinical picture is that of complete recovery unless some complication ensues to demand an operation on the mastoid. The complication is due to a reinactivation of infection in the retrograde thrombosis or from remaining infected cells. The mastoid disease presents a problem in roentgen evaluation. In the event of retrograde thrombosis with little cavitation, less conclusive information is provided. The otologist must recognize this clinical entity and not delay operation, and he should remove sinus and dural plates if there are signs and symptoms of dural irritation or threatened intracranial complications. Wherever there is localization of pus, surgical drainage is required, regardless of how intensive a course of biochemical therapy has been given.

The role and responsibility of the otolaryngologist is in no small measure that of providing the patient with good hearing and restoration to such health as will favor social and economic happiness. To meet this responsibility he must treat ear infections early; he must examine ears routinely for deficiencies of hearing, for conditions affecting hearing or tending to cause aural disease, and he must provide prompt correction. Infants and young

children must be examined for congenital and acquired hearing defects, and preventive measures, such as treatment of sinuses and oral infections, nasal and sinus allergies and removal of infected tonsils and adenoids, should be taken when indicated. If residual hearing is discovered in an apparently deaf child, by means of an electronic hearing device, the child should be placed at once with a trained instructor for lessons in hearing and talking. Hearing aids must be provided when practical. Careful consideration and evaluation must be given the patient with otosclerosis who may be suitable for the fenestration operation.

The biochemicals in common usage have undergone sufficient clinical trial to have rather definite indications. In the active treatment of surgical infections more favorable results are obtainable by identification of the causative organism and the administration of the antibiotic to which the infective agent is most susceptible. Cultures from aural, nasal, or sinus discharge and of exudate and necrotic material, as well as of the blood, should be taken as soon as possible and before any biochemical is given. The antibiotic should not be delayed to await the bacteriological report. The initial therapy is based on the surgeon's judgment as to the responsible organism.

Penicillin has a wide range of effectiveness and can be given to most patients unless there is a history of sensitivity or ineffectiveness from previous use. Lack of response to penicillin is often due to a resistant bacterial strain. Should there be no evidence of general improvement, such as a rapid decline in temperature and relief from pain, a resistant infective agent should be suspected and a sensitivity test made. Because of the specific action of antibiotics and the high incidence of mixed infection, it may be evidence that a single drug is not effective. Penicillin may be continued, in addition to a sulfonamide, triple sulfonamide, streptomycin or aureomycin, or it may be discontinued and replaced by one or more antibiotics to which the organism is more susceptible. More progress is being made in experimental and clinical combined antibiotic therapy. Penicillin and dihydrostreptomycin may be given simultaneously; also, they are now available for administration in combined form. Penicillin, dihydrostreptomycin and intravenous sulfadiazine have been administered in conjunction with surgical treatment of lateral sinus thrombosis, with favorable results. Experimental evidence has been offered by one group of observers that in some instances, when one antibiotic administered in combination with another, the two may neutralize each other.

Intramuscular injections of 25,000 to 50,000 units of aqueous penicillin every three hours or 100,000 units of potassium penicillin combined with 300,000 units of procaine penicillin every twelve to twenty-four hours produces initial high peak blood level concentrations. For administration of penicillin in very large doses, continuous intravenous or intramuscular infusion gives higher and more constant blood levels than do other methods. Oral administration of penicillin maintains low and variable blood levels and is not advised for systemic infections. The oral dose should be three to five times the parenteral dose. Other less effective methods of administration of penicillin are by inhalation of mist or dust, spray, drops, by rubber tube, tampons, ointments and troches.

Prophylactically, penicillin is generally employed in surgical procedures, as it decreases infection in "clean operations".

In view of the possibility of anaphylactoid shock and severe reactions to penicillin, previous penicillin therapy and atopy from any cause should be investigated by careful history taking. A local or diffuse rash with itching may be controlled by use of one of the clinically tried antihistaminics. Systemic allergic reactions are treated with the proper antihistaminic, with shock management when indicated.

Streptomycin is effective against gram-negative organisms.

Dihydrostreptomycin administered intramuscularly is the medicament of choice, as the intravenous and subcutaneous

routes produce constitutional and local reactions. Streptomycin is an effective agent in the treatment of tuberculosis but should not be depended on alone to cure the disease. The immediate results obtained in the treatment of tuberculosis meningitis have seemed promising, but in the long run have been discouraging. The dose recommended for tuberculosis (except miliary and meningeal) is 0.5 Gm. given intramuscularly every twelve hours for six weeks to two months and for miliary and meningeal tuberculosis 0.75 Gm. every twelve hours for from three to four months. The use of streptomycin is limited because of its toxicity and the rapidity of bacterial resistance to its effect.

Aureomycin has a wide range of effectiveness against many gram-negative and gram-positive cocci and bacilli, with clinical evidence of effectiveness against certain strains of virus infection. It has a low toxicity, with little tendency to allergic reaction or to the development of drug-resistant strains of microorganisms. Various strains of staphylococci are susceptible to aureomycin which have become resistant to penicillin in patients who have had penicillin therapy or patients in whom infection has developed from contact with persons who have been given penicillin. The current literature generally stresses the slight tendency of organisms to develop resistance to aureomycin. Some resistance, however, has been recently reported. Aureomycin is advised especially for patients with infections resistant to penicillin, streptomycin and sulfonamides, and for those who exhibit severe and uncontrollable sensitivity to these drugs. Aureomycin is effective orally and the oral route is the method of choice. If oral administration is impractical, the intravenous route may be employed.

Chloromycetin apparently has a limited range of effectiveness. Its clinical usefulness seems most evident in the treatment of bacterial and nonbacterial or virus infections involving both the upper and lower parts of the respiratory tract, acute infectious jaundice and mixed infections of the genitourinary tract.

Aureomycin and chloromycetin are administered almost exclusively by mouth in 250-mg. doses given four times daily. Slight gastrointestinal irritation is a rather frequent reaction to these drugs. They may be better tolerated when given with milk.

The most recent antibiotic, terramycin, is being tried clinically in a number of institutions. At this date it promises a wide range of antibacterial activity. Staphylococcus aureus haemolyticus, Corynebacterium and Aereobacter aerogenes clinically show evidence of being susceptible to terramycin.

As a guide in the treatment of otorhinologic infections, the following suggestions are offered:

1. Doses should be larger for sinus and mastoid infections than for infections of the soft tissues.
2. Continuous treatment with the antibiotic should be avoided after the signs and symptoms of the disease have subsided and remained quiescent for seventy-two hours or longer.
3. Lacking a rapid response in twenty-four to forty-eight hours, continue the same drug in addition to another antibiotic, or discontinue and institute one or more different agents. More progress in combined therapy may be expected.
4. Bacterial resistance develops rapidly to streptomycin, less rapidly to penicillin and more slowly to aureomycin.
5. In severe infections, when quick action is desired, employ two or more antibiotics simultaneously.
6. Avoid the use of antibiotics for minor ailments.

SUMMARY

The biochemicals have been remarkably effective in reducing surgical procedures made necessary by infection. These valuable therapeutic agents, however, have given origin to new clinical entities in mastoid infections which require recognition and may necessitate mastoid operations. It is to be emphasized that although biochemicals have reduced the incidence of

certain otorhinologic surgical procedures, they have not eliminated surgical intervention nor have they replaced the principles of good surgery. Adequate drainage and thorough eradication of irreversible pathologic conditions remains the keynote in management of surgical infections.

RÉSUMÉ

Les agents biochimiques ont grandement diminué les interventions chirurgicales consécutives à l'infection. Les merveilleux produits ont toutefois changé l'aspect clinique de la mastoidite, aspects cliniques qu'il faut reconnaitre pour opérer. Même si les agents biochimiques ont réduit la fréquence de certaines interventions chirurgicales en otorhinolaryngologie, ils n'ont pas fait disparaitre totalement les indications opératoires d'une bonne technique chirurgicale. Un drainage adéquat et l'extirpation complète d'une condition morbide ont toujours leur raison d'être dans les traitements chirurgicaux des infections.

RESUMEN

La bioquímica ha sido notablemente efectiva en la reducción de los procedimientos quirúrgicos hechos necesarios por infección. Sin embargo, los valiosos agentes terapéuticos bioquímicos han dado origen a nuevas entidades clínicas en infecciones mastoideas, las que ameritan ser reconocidas y en las que puede ser necesaria la intervención quirúrgica. Debe señalarse que aun cuando los agentes bioquímicos hayan reducido la incidencia de ciertos procedimientos quirúrgicos otorrinológicos, no han eliminado la intervención quirúrgica ni han reemplazado los principios de la buena cirugía. La canalización adecuada y la erradicación de estados patológicos irreversibles permanece la clave en el manejo de las infecciones quirúrgicas.

ZUSAMMENFASSUNG

Die biochemischen Mittel haben erheblich dazu beigetragen, durch Infektion notwendig gewordene chirurgische Eingriffe zu vermindern. Diese wertvollen Heilmittel haben arber auch zur Entstehung neuer klinischer Einheiten bei Infektionen des Warzenfortsatzes gefuehrt, die erkannt werden muessen und moeglicherweise Operationen am Warzenfortsatz erforderlich machen. Es muss betont werden, dass die biochemischen Mittel zwar die Haeufigkeit gewisser otorhinologischer chirurgischer Eingriffe herabgesetzt, aber weder die chirurgische Behandlung ausgeschaltet noch die Prinzipien guter Chirurgie verdraengt haben. Ausreichende Drainierung und sorgfaeltige Entfernung irreversibler Krankheitsveraenderungen bleibt nach wie vor die Grundlage der Behandlung chirurgischer Infektionen.

SUMÁRIO

Os preparados bio-quimicos tem sido notavelmente efetivos no reduzir processos cirurgicos tornados necessarios pela infeção. Esses valiosos agentes terapeuticos, contudo, tem dado origem a novas entidades clinicas nas infeções mastoidianas que requerem reconhecimento e podem necessitar operações. Deve ser realçado que, embóra os agentes bioquimicos tenham reduzido a incidencia de certos procedimentos cirurgicos otorinolaringologicos eles não eliminaram a intervenção cirurgica, nem substituiram os principios de bôa cirurgia. Drenagem adequada e eradicação plena de condições patologicas irreversiveis ainda são o nó gordio no manejo de infeções cirurgicas.

RIASSUNTO

I moderni medicamenti hanno grandemente ridotto la necessità di operare in casi di malattie infiammatorie. Tali efficaci medicamenti, tuttavia, hanno dato origine a nuovi quadri clinici delle mastoiditi che debbono essere conosciuti e diagnosticati in quanto possono richiedere l'intervento.

E' bene inoltre ripetere che, per quanto i sopradetti medicamenti abbiano ridotto la frequenza di certi interventi otorinojatrici, essi non hanno eliminato l'importanza della cura chirurgica nè sostituito i principi della buona chirurgia.

Forthcoming Regional Meetings of the International College of Surgeons

The Eighth Biennial International Assembly of the International College of Surgeons will be held in Madrid, Spain, May 20-23 inclusive, 1952. The plan for travel includes meetings with the French Chapter of the International College of Surgeons in Paris and Bordeaux, to be followed by meetings in Barcelona, Madrid, Vienna and Amsterdam. Information may be obtained by addressing the Secretariat, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10, Illinois.

The Seventeenth Annual Assembly of the United States Chapter will be held at the Conrad Hilton Hotel (formerly the Stevens) in Chicago, Sept. 2-5 inclusive, 1952. Further information may be obtained by communicating with Dr. Arnold S. Jackson, Secretary, United States Chapter, 1516 Lake Shore Drive, Chicago 10, Illinois.

Regional Meetings

United States Chapter, International College of Surgeons

Location	Date	Chairman
Pittsburgh, Pennsylvania William Penn Hotel	March 14-15, 1952	Dr. Elmer S. A. King 3700 Fifth Avenue
Tulsa, Oklahoma Mayo Hotel	March 28, 1952	Dr. André B. Carney 915 S. Cincinnati
Kansas City, Missouri President Hotel	April 27-28-29, 1952	Dr. Claude Hunt 1612 Professional Bldg.
Colorado Springs, Colorado Broadmoor Hotel	May 2-3, 1952	Dr. Kenneth Sawyer 1820 Gilpin Street, Denver

For information, please communicate with the respective chairmen as listed above.

Editorials

Man of Destiny

The recent publication of *Doctor and I*, a biography of the late Dr. Fred H. Albee by Louella Berry Albee, his wife, reminds us again of a fact often noted before, namely, that the life career of a great doctor nearly always reads like a high romance. The action is there, the suspense is there, the successes and failures and struggles—all are there, surrounding the hero in their due proportion. The characters are there, insistent and alive—and what characters! There are few walks in life, if any, that provide a more varied view of the human scene. Doubtless this is what lies behind the great popularity of novels about doctors; the lay public is fascinated by the glimpses they afford of a world that takes in sooner or later, in one way or another, every facet of the sharp-cut stone of human experience. Doctors are human; they find this flattering. Here and there is one—and he may be a more than excellent doctor, too—who unconsciously "plays up" the romantic aspect of his profession.

Fred Albee, however, was not among these. There was little of the histrionic in his nature. Though one of the friendliest and most hospitable men that ever lived, his character was as rugged and forthright as the Maine farm that was his birthplace.

His childhood was that of the traditional "great American"; early farm work, four-mile trudges to school, kerosene lamps to study by in the evening, and snow drifting through the cracks in the eaves of his bedroom. Young Albee throve under this austere regime and, perhaps because of the discipline it afforded, was able to select his life's work very young. To become a doctor was his unswerving ambition. In his later youth this ambition was heightened and turned toward surgery by watching the grafting of trees. In all probability it was this experience, coming as it did at a time when the youth's mind was particularly receptive to suggestion, that eventually led him to concentrate on the surgery of the human skeleton and to become the wizard he was in dealing with bone.

Despite the hardships of his youth and the struggle of establishing himself securely in his profession, Dr. Albee was still a young man when his work in bone grafting drew the world's attention. From that time on his career was an almost unbroken series of successes, many of them spectacular and all of them sound. The stars in their courses seemed to fight for him, and his friends were wont to call it "the Albee luck." Luck, however, had little to do with the matter; it seldom does when one looks below the surface. It is aptly said that a man who wakes up to find himself famous has not been asleep, and if ever this epigram was fitly applied, it is fitly applied to Fred Albee. He was an indefatigable worker. It was a marvel to those who knew him how he could accomplish so much, travel so much, write so much and literally make over the handicapped lives of so many patients—and still have plenty of time to enjoy his friends!

The general outlines of Albee's life are well known to nearly all physicians and surgeons and need not be recounted here. From service in World War I to social intercourse with the mighty in all lands, his career was crowded with acclamation, citations and honors, but there was no change in the man who received them all, beyond a rich ripening into maturity. He was an early member of the International College of Surgeons and one of its earliest International Presidents, and found no duty in this connection too demanding for him to perform. He died on February 15, 1945, leaving behind him a record of peerless achievement and the

memory of a true and faithful friend to all who knew him. In addition to his devoted wife he left a son, Dr. Fred H. Albee Jr., to carry on the methods he created.

The story of such a life is always inspiring. Mrs. Albee, who was at his side through it all, not excepting World War I—for she went with him to France and served in the Red Cross—is best qualified to recount the story in detail. In so doing she has told two stories in one; the story of a surgeon who represents the best in surgery, and the story of a marriage that was almost an epic. These two worked shoulder to shoulder for thirty-eight years, and found it satisfying to the very end. Nevertheless there was room in their hearts for friendship, as Mrs. Albee's narrative abundantly shows. It is refreshing in times like these to read such a narrative and realize anew how rich both life and marriage can be made.

M. T.

Hippocrates on Epilepsy

We have recently encountered a delightful translation of the medical works of Hippocrates, including his aphorisms, lectures and quasi-philosophic essays. The translators are John Chadwick, M.A. (Cantab.), sometime Scholar of Corpus Christi College, Cambridge, and W. N. Mann, F.R.C.P. (London), assistant physician in Guy's Hospital. Charles C Thomas of Springfield, Illinois, is the publisher. A passage on epilepsy, at that time called the 'sacred disease' and believed to be a visitation from heaven, is so characteristic of Hippocrates' inquiring mind and rejection of superstition that we believe our readers will find it as refreshing as we did:

"I do not believe that the 'Sacred Disease' is any more divine or sacred than any other disease but, on the contrary, has specific characteristics and a definite cause. Nevertheless, because it is completely different from other diseases, it has been regarded as a divine visitation by those who, being only human, view it with ignorance and astonishment. This theory of divine origin, though supported by the difficulty of understanding the malady, is weakened by the simplicity of the cure consisting merely of ritual purification and incantation. If remarkable features in a malady were evidence of divine visitation, then there would be many 'sacred diseases'. Quotidian, tertian and quartan fevers are among other diseases no less remarkable and portentous and yet no one regards them as having a divine origin. I do not believe that these diseases have any less claim to be caused by a god than the so-called 'sacred' disease but they are not the objects of popular wonder. Again, no less remarkably, I have seen men go mad and become delirious for no obvious reason and do many strange things. I have seen many cases of people groaning and shouting in their sleep, some who choke; others jump from their bed and run outside and remain out of their mind till they wake, when they are as healthy and sane as they were before, although perhaps rather pale and weak. These things are not isolated events but frequent occurrences. . . It is my opinion that those who first called this disease 'sacred' were the sort of people we now call witch-doctors, faith-healers, quacks and charlatans."

It is always profitable to remind ourselves occasionally of the great dignity of our profession as manifested in eminent physicians and surgeons of the past. Hippocrates is full of it; one can scarcely turn a page of this volume without being impressed with his value he set on professional integrity.

M. T.

An Invitation

to the

Eighth International Assembly

of the

International College of Surgeons

Madrid, Spain, May 19-24, 1952

Faculty of Medicine, University City

A most cordial and fraternal invitation is hereby extended to all surgeons throughout the world to attend the Eighth International Assembly of the International College of Surgeons. This Assembly will be held in Madrid, a city of immense historical and scenic interest, and its program will include significant contributions from eminent surgeons of many nations. No effort will be spared to assure our guests the utmost comfort and pleasure in every way, and it is confidently anticipated that those who attend will remember the occasion as one of the highest scientific and cultural value and the ultimate in relaxation and enjoyment. It is hoped that the wives of our guests will accompany them, and special arrangements have been made to entertain them.

We should like to emphasize the keen appreciation of the Spanish Chapter of the international ideals and purposes of the College, and to assure all those who do us the honor to attend that we will endeavor in every way to make the occasion memorable.

—Prof. Dr Martin Lagos, President, Spanish Chapter, International College of Surgeons

Prof. Dr. Alfonso de la Fuente, Secretary General, Spanish Chapter

PRINCIPAL THEMES OF ASSEMBLY

Surgery of Tumors of the Bladder
Surgery of the Hip
Cardiovascular Surgery
Surgery of Tumors of the Rectum

SPECIAL SECTIONS

Obstetrics and Gynecology
Traumatology and Orthopedics
Urology
Otorhinolaryngology
Neurosurgery
Ophthalmology
Thoracic Surgery
Vascular Surgery
General Surgery
Anesthesiology
Radiology
Pathology

GENERAL PROGRAM

May 19	Monday	4 p.m.	House of Delegates Meeting—Place to be announced later (All delegates are required to attend. Other members of the College are cordially invited to be present.)
		8 p.m.	Reception
May 20	Tuesday	Morning	Inaugural Ceremonies; formal opening of Assembly
		Afternoon	Sectional Meetings (scientific papers, demonstrations and discussions)
May 21	Wednesday	Morning	Operative clinics and scientific papers
		Afternoon	Scientific papers
May 22	Thursday		Excursion to El Escorial or Toledo
May 23	Friday	Morning	Scientific sessions: convocation; induction of new members into Spanish Chapter; conferring of honorary degrees
		Afternoon	Scientific sessions
		Evening	Banquet
May 24	Saturday	Morning	Scientific sessions and closing session

EXHIBITS

During the Assembly, scientific and commercial exhibits will be shown in the Central Pavilion of the Faculty of Medicine, University City. In addition, there will be correlated exhibits of bibliographic material related to surgery, etc.

A special Ladies' Program has been prepared, which will consist of sightseeing in Madrid and environs, visits to museums, special concerts, fashion shows, etc.

REGISTRATION

Those attending the Assembly should register at the office of the Secretary of the Assembly in the Faculty of Medicine, University City.

Under the auspices of the Council for the Co-Ordination of International Congresses of Medical Sciences (UNESCO), a special postgraduate course of lectures will be held in collaboration with the Eighth International Assembly of the International College of Surgeons. For complete information on this course, please address the President of the Spanish Chapter, Prof. Dr. Francisco Martín Lagos, Velázquez 98, Madrid, Spain.

ORGANIZATION COMMITTEE

President:
Prof. Dr. Martín Lagos
Madrid

Vice-Presidents:
Prof. Garcia Orcoyen
Madrid
Prof. Dr. Alfonso de la Peña
Madrid
Prof. Dr. José Soler-Roig
Barcelona

Secretary General
Prof. Dr. Alfonso de la Fuente
Madrid

Registration
Dr. V. M. Nogueras
Madrid

Papers
Dr. Merchán
Madrid

Open Sections
Dr. Varela
Madrid

Chapter News

International College of Surgeons

United States and Canadian Chapters

Arnold S. Jackson, M.D., F.A.C.S., F.I.C.S., Secretary

Alabama Section: Alabama Section of the United States Chapter of the International College of Surgeons in conjunction with the Jefferson County Medical Society was host to the Southern Assembly, including the states of Alabama, Georgia, Florida, Louisiana, Mississippi, North and South Carolina and Tennessee, on Ferbuary 15 and 16, with headquarters at the Tutwiler Hotel in Birmingham. Meetings were held at the hotel on the first day and at the University of Alabama Medical School auditorium on the second day. The medical profession at large, interns, residents, medical students and hospital personnel were invited to all the sessions. Dr. Paul Shannon of Birmingham was General Chairman. An outline of the program follows:

February 15, 9:00 a.m. to noon

Personal Approach to Some Technical Problems of Gastrointestinal Surgery
Dr. Claude J. Hunt, Kansas City, Missouri

Symptoms Arising in the Urinary Tract Often Misinterpreted as Gynecological in Origin
Houston S. Everett, Baltimore

Giant Cell Tumors
Dr. Henry W. Meyerding, Rochester, Minnesota; President of the United States Chapter, International College of Surgeons

Present Day Management of Cerebral Palsy
Dr. John W. Simpson, Birmingham, Moderator

February 15, 2:00 to 5:00 pm.

Surgical Treatment of Mitral Stenosis
Dr. Edgar Davis, Washington, D. C.

Urinary Stress Incontinence in the Female
Dr. Robert Lich, Louisville

Present Concepts in Treatment of Hyperthyroidism
Dr. Arnold S. Jackson, Madison

Prolonged Labor
Dr. Louis Douglass, Baltimore

Present-Day Concepts in Surgical Manage-
Dr. Robert L. Sanders, Memphis, Moderator

February 15, 6:45 p.m.

Banquet, Ballroom, Tutwiler Hotel
John Roy Carlson, Guest Speaker—"The Middle East Powder Keg"

February 16, 9:00 a.m. to noon

Early Diagnosis of Carcinoma of Uterus
Dr. Frederick K. Falls, Chicago

The Gallbladder Problem
Dr. Robert L. Sanders, Memphis

Tumors of Testes
Dr. M. Friedman, New York

The Role of Cancer Cytology in Medical Practice
Dr. J. E. Ayre, Miami

Endometriosis (Panel)
Dr. Byrn Williamson, Birmingham, Moderator

February 16, 2:00 to 5:00 p.m.

Treatment of the Traumatic Paraplegic
Dr. Eben Alexander, Winston-Salem

Surgery in Tuberculosis of the Lungs
Dr. Moses Behrend, Philadelphia

Some Common Problems in Plastic Surgery
Dr. Neal Owens, New Orleans

Present-Day Surgical Treatment of Tuberculosis of Chest (Panel)
Dr. Charles J. Donald, Birmingham, Moderator

Brazilian Chapter: Under the auspices of the Brazilian Chapter of the International College of Surgeons, a postgraduate course in Plastic Surgery was presented at the Hospital das Clinicas of the Faculty of Medicine of Sao Paulo from February 4 through February 20. The classes were held in the auditorium at night and surgical demonstrations were conducted during the day.

Dr. José Avelino Chaves, President of the Brazilian Chapter, officially opened the course, which was conducted by Dr. Roberto Farina, A.I.C.S., and Dr. Victor Spina, F.I.C.S., in collaboration with Dr. de Carma Russo.

Austrian Chapter: Under the auspices of the Austrian Chapter of the International College of Surgeons, a symposium on Carcinoma will be held in the Faculty of Medicine, University of Vienna, on May 26 and 27, 1952. Information may be obtained from the Secretary of the Austrian Chapter, Prof. Dr. Felix Mandl, Reichsratstrasse 11, Vienna 1, Austria. The preliminary program follows:

The Importance of Aortic Ligation in the

Surgical Treatment of Cancer of the Rectum and Sigmoid
Dr. Harry E. Bacon, Philadelphia; Chief, Department of Proctology, Temple University College of Medicine

Neoplasms of the Renal Pelvis
Dr. M. Leopold Brodny, Boston; Professor of Urology, Tufts Medical College

A Comparative Review of the Origin, Diagnosis and End-results in 707 Cases of Gastric Carcinoma
Dr. Robert H. Abrahamson, Stamford, Connecticut; Professor of Surgery, New York University Postgraduate School of Medicine

Giant Cell Tumors of Osseous Origin
Dr. Edward L. Compere, Chicago; Professor of Surgery, Northwestern University Medical School

Carcinoma of the Thyroid
Dr. Arnold S. Jackson, Madison, Wisconsin; Jackson Clinic

Malignancies of the Kidney
Dr. Oswald S. Lowsley, New York; Director, Department of Urology, James Buchanan Brady Foundation, New York Hospital

Malignant Tumors of the Neck
Dr. Samuel L. Perzik, Beverley Hills, California; Professor of Surgery, University of Southern California Medical School

Carcinoma of the Thyroid Gland
Dr. Frank Teller, Brooklyn, New York; Chief, Thyroid Clinic, Israel Zion Hospital

Malignant Tumors of the Brain
Dr. Roland M. Klemme, St. Louis; Professor of Surgery and Chief, Division of Neurosurgery, St. Louis University

Regional Meeting in Pittsburgh: The Pennsylvania section of the United States Chapter of the International College of Surgeons will be host to the Northeastern Assembly, including the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, West Virginia, Pennsylvania, the District of Columbia and the Province of Quebec, at a scientific meeting on March 13 and 14 with headquarters at the William Penn Hotel in Pittsburgh. The Committee on Arrangements consists of Dr. Elmer S. A. King, Chairman, and Drs. Charles J. Barone, William A. Barrett, John Donaldson, Harold G. Kuehner, W. Scott Nettrour, Frederick Fagler, Norman Oschenhirt, John W. Shirer and John Stinson.

An outline of the program follows:

Thursday, March 13, 9:00 a.m. to 5:00 p.m.

The Present Status of Cardiac Surgery
Dr. Julian Johnson, Philadelphia

Treatment of Some Surgical Conditions of the Neck
Dr. Arnold S. Jackson, Madison, Wisconsin

Surgery in Carcinoma of the Left Colon
Dr. Peter Rosi, Chicago

The Enigma of Retroperitoneal Masses
Dr. M. Leopold Brodny, Boston

Vaginal Hysterectomy—a Review of 129 Cases Indicating Its Advantages
Dr. Alexander A. Levi, Newton Center, Massachusetts

Exchanges of Potassium in Relation to the Metabolism of Patients Undergoing Surgery
Dr. T. S. Danowski, Pittsburgh

Luncheon

Panel Discussion—(Obstetrics and Gynecology)
Dr. C. J. Barone, Pittsburgh, Moderator
Collaborators:
Dr. Vincent P. Mazzola, Brooklyn
Vaginal Hysterectomy—Technic and Indications
Dr. Joseph Hupp, Pittsburgh
Endometriosis
Dr. Eugene Conti, Pittsburgh
Saddle Block Anesthesia in Obstetrics
Dr. William Gibson, Pittsburgh
Hazards of Breech Delivery

Panel Discussion—Ureteral Injuries in Pelvic Surgery
Dr. William A. Barrett, Pittsburgh, Presiding
Dr. Thomas D. Moore, Memphis, Moderator
Collaborators:
Dr. Elmer Hess, Erie, Pennsylvania
Dr. Carlton Price, Washington, D. C.
Dr. Wayne W. Babcock, Philadelphia

Banquet and Entertainment in Evening

Friday, March 14, 9:00 a.m. to 5:30 p.m.

Twelve Years' Experience with the Use of Continuous Spinal Anesthesia in Surgery
Dr. William T. Lemmon, Philadelphia

Recurrence Thyrotoxicosis
Dr. L. H. Landon, Pittsburgh

Intestinal Obstruction
Dr. Charles Lupton, Norfolk, Virginia

Pain; Significance to Surgeon
Dr. Richard Behan, Pittsburgh

View Exhibits

Recent Trends in Esophageal Surgery
Dr. Philip Thorek, Chicago

A New Surgical Treatment for Hirschprung's Disease
Dr. Orvar Swenson, Boston

Luncheon

Panel Discussion—*Symposium in Thyroid Disease with Particular Reference to Radioactive Iodine*
Dr. John Shirer, Pittsburgh, Moderator
Collaborators:
Dr. John Stinson, Pittsburgh
Dr. Allen P. Graham, Pittsburgh
Dr. Norman Ochsenhirt, Pittsburgh
Dr. T. S. Swan, Pittsburgh
Dr. Campbell Moses, Pittsburgh
Dr. E. P. Buchanan, Pittsburgh
View Exhibits
Panel Discussion—*Artificial Hip Prostheses*
Dr. John Donaldson, Pittsburgh
Dr. Henry Meyerding, Rochester, Minnesota
Dr. Leonard Peterson, Washington, D. C.

The United States Chapter

of the

International College of Surgeons

in cooperation with

The Cook County Graduate School of Medicine

takes pleasure in announcing

Preassembly Postgraduate Courses

in

General Surgery, Gynecology and Obstetrics, Orthopedic Surgery, Urology, Proctology and Basic Sciences in Clinical Surgery

JULY 14-26, 1952

to be held at the

Cook County Graduate School of Medicine

For full details, address the Secretary, Preassembly Postgraduate Courses, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10, Illinois.

For other postgraduate courses, see the following pages.

Postgraduate Courses

Preassembly Courses Offered by the International College of Surgeons in Cooperation with the Cook County Graduate School of Medicine

The Seventeenth Annual Assembly of the United States and Canadian Chapters of the International College of Surgeons will be held in Chicago, September 2 to 5 inclusive, 1952. In keeping with the educational activities and objectives of the International College of Surgeons, arrangements have been made to offer, in cooperation with the Cook County Graduate School of Medicine, a two-week Preassembly Postgraduate Course from July 14 through July 26.

Since the course is designed primarily as an intensive review for members of the International College of Surgeons and those preparing for its examination, the number of registrations will be limited.

The course will consist of illustrated lectures, demonstrations, presentation of cases and surgical clinics. The teaching faculty will be comprised of members of the attending and associate staffs of Cook County Hospital and prominent guest lecturers from other cities.

In addition to general sessions for the entire group, there will be numerous section sessions for surgeons primarily interested in the following fields:

General Surgery
Orthopedic Surgery
Gynecology
Urology
Proctology
Basic Sciences in Clinical Surgery

Requests for application forms or additional information may be addressed to the Secretary, Preassembly Postgraduate Courses, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10, Illinois.

Courses Offered by the German Chapter, International College of Surgeons

July 15—August 15, 1952

The German Chapter of the International College of Surgeons is arranging a four-week postgraduate course, open to all surgeons except those in the Iron Curtain countries. The tentative date for the beginning of the course is January 14, 1952. The following subjects will be presented:

1. *Thoracic Surgery. Given by Prof. Dr. Albert Lezius,* Director of Surgical Department, University of Hamburg, and Assistants.
   a. Modern methods of anesthesia in chest surgery, with practical demonstrations
   b. Bronchoscopy
   c. Bronchography
   d. Intubation
   e. Postoperative care of the Bronchial Tree
   f. Operative treatments of Carcinoma of the Lungs
   g. Operative treatments of Bronchiectasis
   h. Operative treatment of Pulmonary Tuberculosis
   i. Operative treatments of tumors of the Mediastinum
   j. Surgery of the Esophagus and Cardia
   k. Operative treatment of congenital and acquired cardiac disease. (Fallot's Tetralogy, Ductus Botalli, Coarctation of the Aorta, Stenosis of the Aortic Valve, Angina Pectoris.)
2. *Surgery of the Stomach. Given by Prof. Dr. G. E. Konjetzny,* Director Emeritus, Department of Surgery, University of Hamburg.
   a. Pathologic anatomy and pathological physiology of gastric ulcer
   b. Operations on the stomach
   c. Evaluation of Dragsted's operation and sympathectomy
3. *Urologic Surgery. Given by Prof. Dr. Hans T. Junker,* Chief Urologic Clinic, Allgemeines Krankenhaus Barmbeck, Hamburg-Wandsbek.

a. Cystoscopy
b. Pyelography
c. Roentgen diagnosis of diseases of the Kidneys
d. Endoscopic operative procedures in tumors of the Bladder
e. Tumors of the Prostate (particularly hypertrophy)
f. Prostatectomy
   1. Freyer's method
   2. Millin's procedure
   3. Harris' method
g. Total cystectomy for carcinoma of the bladder
h. Miscellaneous subjects.

4. *Medullary Nailing of Fractures of Long Bones: Given by Prof. Dr. Gerhard Küntscher,* Surgeon in Chief, Kreiskrankenhaus, Schleswig.
   a. Theoretic Considerations of Medullary Nailing
   b. Indications for Medullary Nailing
   c. Bones of the Leg, Arm and Forearm
   d. Medullary Nailing in Operations for Pseudo-Arthrosis
   e. Operative Technic
   f. Film Presentation

Place: Postgraduate courses in Thoracic and Gastric Surgery will be held at the Surgical clinics of the University of Hamburg. The course in Urologic Surgery will be held at the Allgemeines Krankenhaus Barmbeck, Hamburg-Wandsbek.

Tuition: For those residing in Europe, the tuition will be DM 100 per course.

For those residing in the United States, Canada, Central America and South America, the tuition will be $100 per course.

Vierwöchiger Fortbildungskurs Deutsches Chapter, International College of Surgeons

Das Deutsche Chapter des International College of Surgeons beabsichtigt, einen vierwöchigen Fortbildungskurs für junge Ärzte und Chirurgen zu halten. Folgende Hauptthemen sind vorgesehen:

1. Thoraxchirurgie: Prof. Dr. Albert Lezius, Direktor der Chirurgischen Universitäts-Klinik und Poliklinik, Hamburg-Eppendorf, und Mitarbeiter.
   a. Moderne Narkose und Anesthesieverfahren für die Thoraxchirurgie mit praktischen Uebungen
   b. Bronchoskopie
   c. Bronchographie
   d. Intubation
   e. Post-Operative Bronchialtoilette
   f. Die Operative Behandlung des Lungencarcinoms
   g. Der Bronchiektasen
   h. Der Lungentuberkulose
   i. Die Geschwülste des Mediastinums
   j. Die Chirurgie des Oesophagus und der Cardia
   k. Die Chirurgie der Angeborenen und der erworbenen Herzfehler (Fallot'sche Tetralogie, Ductus Botalli, Coarctation der Aorta, Pulmonalstenose, Mitralstenose, Aortenklappenstenose, Angina pectoris)
2. Chirurgie des Magens: Prof. Dr. G. E. Konjetzny, Direktor Emeritus der Chirurgischen Universitäts-Klinik und Poliklinik, Hamburg-Eppendorf
   a. Pathologische Anatomie und Pathologische Physiologie des Magengeschwürs
   b. Die Operationen am Magen
   c. Stellungnahme zur Operation nach Dragstedt und zur Sympathektomie
3. Chirurgische Urologie: Prof. Dr. Hans T. Junker, Chefarzt, der Chirurgische-Urologischen Klinik des Allgemeines Krankenhaus, Barmbek.
   a. Cystoskopie
   b. Pyelographie
   c. Röntgendiagnose der Nierenerkrankungen
   d. Operative endoskopische Eingriffe bei Blasentumoren
   e. Prostatahypertrophie
   f. Die Prostektomie nach Freyer, nach Millin und nach Harris
   g. Die totale Cystektomie beim Blasencarcinom
   h. Miscellany
4. Die Marknagelung von Frakturen Langer Röhrenknochen: Prof. Dr. Gerhard Küntscher, Chefarzt der Chirurgische Abteilung Kreiskrankenhaus Schleswig
   a. Theoretische Grundlagen der Marknagelung
   b. Indikationen die Oberschenkelmarknagelung
   c. Die Unterschenkelmarknagelung Oberarm und Unterarmmarknagelung
   d. Die Marknagelung bei Pseudarthrosenoperationen
   e. Operationstechnik
   f. Filmvorführungen

Die Zeit: Voraussichtlicher Beginn des Kurses

am 15 Juli 1952.

Ort des Kurses: Thoraxchirurgie und Magenchirurgie — Hamburg-Eppendorf, Chirurgische Universitäts-Klinik.

Urologie — Allgemeines Krankenhaus Barmbeck, Hamburg-Wandsbek.

Kosten: Kosten für Angehörige europäischer Staaten DM 100.

Kosten für Angehörige der U.S.A., der Mittel und Südamerikanischen und Canada Staaten 100 Dollar.

Die Kurse: Die Kurse bestehen in theoretischen Vorlesungen unde in täglichen Uebungen und Operationen.

Kursleiter: Prof. Dr. Albert Lezius: Prof. Dr. G. E. Konjetzny: Prof. Dr. Hans T. Junker: Prof. Dr. Gerhard Küntscher.

Anmeldungen bis 15 Juli 1952: Prof. Dr. A. Lezius, Direktor, Chirurgischen Universitäts-Klinik und Poliklinik, Hamburg-Eppendorf.

Cours Avancés Offerts par le Chapitre Allemand

du College International des Chirurgiens

Le Chapitre Allemand du Collège International des Chirurgiens organise un cours avancé de quatre semaines. Les sujets suivants seront traités:

1. Chirurgie Thoracique. Par Monsieur le Professeur Albert Lezius, Directeur de la section de Chirurgie a l'Université de Hamburg et ses Assistants.
   a. Méthodes modernes d'anesthésie en chirurgie thoracique, avec démonstrations pratiques
   b. Bronchoscipe
   c. Bronchographie
   d. Intubation tracheale
   e. Traitement post-opératoire en matière d'arbre bronchique
   f. Traitement chirurgicale des cancers du poumon
   g. Traitement chirurgicale des dilatations des bronches
   h. Traitement chirurgicale de la tuberculose pulmonaire
   i. Traitement chirurgicale des tumeurs du médiastin
   j. Chirurgie de l'ésophage et du cardia
   k. Traitement chirurgicale des cardiopathies congénitales et acquises (Tétralogie de Fallot, Persistance du Trou de Botal, Sténose de l'Isthme de l'Aorte, Retrécissement de l'Orifice Aortique, Angine de Poitrine)
2. Chirurgie Gastrique. Par Monsieur le Professeur G. E. Konjetzny, Directeur Emérite de la Section de Chirurgie à l'Université de Hamburg.
   a. Anatomo Pathologie et Physio Pathologie de l'ulcère de l'estomac
   b. Chirurgie gastrique
   c. Discussion de la valeur de l'Opération de Dragstedt et de la Sympathectomy
3. Urologie. Par Monsieur le Professeur Hans T. Junker, Chef de la Clinique d'Urologie à Allegemeines Krankenhaus, Barmbeck, Hamburg-Wandsbek.
   a. Cystoscopie
   b. Pyélographie
   c. Radiologie dans de diagnostic des maladies rénales
   d. La Chirurgie endoscopique des tumeurs de la vessie
   e. Les tumeurs de la prostate
   f. Prostatectomie
      1. Par la méthode de Freyer
      2. Par la méthode de Millin
      3. Par la méthode de Harris
   g. Cystectomie totale pour cancer de la vessie
   h. Sujets divers
4. L'Enclavage Medullaire des Fractures des os Longs. Par Monsieur le Professeur Gerhard Küntscher, Chirurgien Chef, Kreiskrankenhaus, Schleswig
   a. Considérations théoriques sur l'enclavage médullaire
   b. Les indications de l'enclavage médullaire
   c. Os de la jambe, du bras et de l'avant bras
   d. Le traitement des Pseudarthrosis par l'enclavage médullaire
   e. Téchnique opératoire
   f. Présentation de films.

Dâte: La dâte prévue pour le début du cours est le 15 juillet 1952.

Place: Les course avancés de Chirurgie Gastrique et Thoracique seront donnés à la Clinique Chirurcale de l'Université de Hamburg. Le cours d'Urologie sera donné à l'Allegemeines Krankenhaus, Barmbeck, Hamburg-Wandsbek.

Inscriptions: Pour ceux habitant l'Europe, l'inscription sera de 100 DM.

Pour ceux habitant les Stats-Unis, l'Amerique Centrale et du Sud et le Canada, l'Inscription sera de $100 par cours.

Les Cours: Les cours consisteront de demonstrations pratiques, de cours théoriques et de techniques opératoires donnés par les professeurs.

Les Directeurs: Les Directeurs des cours avancés sont: Messieurs Les Professeurs Albert Lezius, G. E. Konjetzny et hans T. Junker.

Les démandes de renseignements et les inscriptions seront reçues jusqu'au le 15 juillet 1952, et devront être adressées à Monsieur le Professeur A. Lezius, Directeur de la Section de Chirurgie, Université de Hamburg, Hamburg, Eppendorf, Allemagne.

Cursos de Post-Graduado Ofrecidos por el Capitulo Aleman del Colegio Internacional de Cirujanos

El Capítulo Aleman del Colegio Internacional de Cirujanos esta preparando un curso de Post-Graduado de cuatro semanas de duración. La siguiente materi sera presentada.

1. Cirugía de Torax: Explicada por el Profesor Dr. Albert Lezius, Director del Departamento de Cirugía, La Universidad de Hamburgo, y por sus asistentes.
   a. Metodos modernos de anestesia en cirugía de torax, con demonstraciones practicas
   b. Broncoscopía
   c. Broncografía
   d. Intubación
   e. Cuidado post-operatorio del Arbol Bronquial
   f. Tratamiento quirurgico del Carcinoma del Pulmón
   g. Tratamiento quirurgico de la bronquiectasía
   h. Tratamiento quirurgico de la Tuberculosis pulmonar
   i. Tratamiento quirurgico de los tumores del mediastino
   j. Cirugía del esofago y cardias
   k. Tratamiento quirurgico de enfermedades cardiacas congenitas y adquiridas (Tetralogía de Fallot, Coartación de la Aorta, Estenosis de la Valvula Aortica, Angina Pectoris)
2. Cirugía del Estómago: Explicada por el Profesor Dr. G. E. Konjetzny, Director Emerito del Departamento de Cirugía de la Universidad de Hamburgo.
   a. Anatomía y fisiología patologica de la úlcera gastrica
   b. Operaciones del estomago
   c. Evaluación de la operación de Dragstedt y la simpatectomía
3. Cirugía Urologica: Explicada por el Prof. Dr. Hans T. Junker, Jefe de la Clinica Urologica, Allgemeines Krankenhaus Barmbeck, Hamburg-Wandsbek
   a. Cistoscopía
   b. Pielografía
   c. Diagnostico Radiologico de las Enfermedades de los Riñones
   d. Tenicas operatorias endoscopicas en tumores de la vejiga
   e. Tumores de la prostata (Particularmente la hipertrofía)
   f. Prostatectomía
      1. Metodo de Freyer
      2. Metodo de Millin
      3. Metodo de Harris
   g. Cistectomía total en Carcinoma de la vejiga
   h. Temas Miscelaneos
4. Aplicación Medular de Clavos en Fractures de los Huesos Largos: Explicada por el Profesor Dr. Gerhard Küntscher, Jefe en Cirugía, Kreiskrankenhaus, Schleswig.
   a. Consideraciones teoricas sobre aplicación medular de clavos
   b. Indicaciones
   c. Huesos de la pierna, brazo y antebrazo
   d. Aplicación de clavos en pseudo-arthrosis
   e. Tecnocas operatorias
   f. Presentación de Películas

Fecha: La fecha para el comienzo del curso es Julio 15 de 1952

Lugar: Los cursos de post-graduado en cirugía de torax y estómago se llevaran a cabo en las clínicas, quirurgicas de la Universidad de Hamburgo. El curso en cirugía urologica se ofrecera en Allgemeines Krankenhaus Barmbeck, Hamburgo-Wandsbek.

Matricula: Para aquellos que residen en Europa, el costo será de DM 100 cada curso.

Para aquellos que residen en Los Estados Unidos, Canadá, Centro y Sud America, el costo será de $100.00 cada curso.

Cursos: Los cursos consistiran en demostraciones practicas diarias, conferencias y procederes quirurgicos realizados por los profesores y asistidos por los post-graduados.

Directores: Prof. Dr. Albert Lezius, Prof. Dr. G. E. Konjetzny, Prof. Dr. Hans T. Junker, Prof. Dr. Gerhard Küntscher.

Solicitudes de Matricula: Solicitudes de matricula para los cursos de post-graduados seran aceptadas hasta Julio 15 de 1952 y deben ser dirigidas a la Profesor Dr. Albert Lezius, Jefe del Departamento Quirurgico de la Universidad de Hamburgo, Hamburgo-Eppendorf, Alemania.

Corsi per Laureati Offerti Dalla Sezione Tedesca dell' International College of Surgeons

La Sezione Tedesca dell' "International College of Surgeons" sta preparando un corso per laureati della durata di un mese. Saranno presentati i seguenti argomenti:

1. Chirurgia Toácica: Prof. Dott. Albert Lezius, Direttore della Clinica Chirurgica dell'Università d'Amburgo, ed í suoi assistenti.
   a. Metodi moderni d'Anestesia in chirurgia torácica, con dimostrazioni pratiche
   b. Broncoscopia
   c. Broncografia
   d. Intubazione
   e. Cura postoperatoria dell'àlbero bronchiale
   f. Trattamento operatorio del cancro del polmone
   g. Trattamento operatorio delle bronchietasie
   h. Trattamento operatorio della tubercolosi polmonare
   i. Trattamento chirurgico di tumeri del mediastino
   j. Chirurgia dell'esofago e del cardia
   k. Trattamento operatorio delle cardiapatie congenite ed acquisite (Tetralogia di Fallot, Dotto di Botallo, Coartazione aortica, Stenosi della valvola aortica, Angina di Petto)
2. Chirurgia Dello Stomaco: Prof. Dott. G. E. Konjetzny, Direttore Emerito della Clinica Chirurgica dell'Università d'Amburgo
   a. Anatomia e fisiologia patalogica dell'úlcera gastrica
   b. Interventi sullo stomaco
   c. Valutazione dell'intervento di Dragstedt e simpaticectomia
3. Chirurgia Urologica: Prof. Dott. Hans T. Junker, Capo della Clinica Urologica, Allgemeines Krankenhaus, Barmbeck, Amburgo-Wabdsbej
   a. Cistoscopia
   b. Pielografia
   c. Diagnosi radiologica delle malattie del rene
   d. Procedure operatorie endoscopiche dei tumori della vescica
   e. Tumori della prostata (particolarmente ipertrofia)
   f. Prostatectomia
      1. Metodo di Freyer
      2. Metodo di Millin
      3. Metodo di Harris
   g. Cistectomia totale nel carcinoma della vescica
   h. Argomenti vari
4. Trattamento Delle Fratture Delle Ossa Lunghe Con il Metodo Delle'Inchiodamento Intramidollare
   a. Considerezioni teoriche
   b. Indicazioni
   c. Applicazioni all'arto superiore ed inferiore
   d. Applicazioni in casi di pseudoartrosi
   e. Tecnica operatorie
   f. Prezentazione di radiogrammi

La Data: La data dell'inizio del corso e il 15 luglio 1952

La Situazione: I corsi di chirurgia torácica e gastrica saranno tenuti alla Clinica Chirurgica dell'Università d'Amburgo. Il corso in chirurgica urologica sarà tenuta nella Allgemeines Krankenhaus Barmbeck, Amburgo-Wandsbek.

Tassa: Per quelli che risiedono in Europa, la tassa sarà di 100 D.M.

Per quelli che risiedono negli Stati Uniti, America Centrale e Medionale e Canadà, la tassa sarà di $100.00 per corso.

I Corsi: I corsi consisteranno de dimostrazioni pratiche, lezioni e interventi operatori quotidiane attuate dagli insegnanti e dei laureati.

I Direttori: Prof. Dott. Albert Lezius, Prof. Dott. G. E. Konjetzny, Prof. Dott. Hans T. Junker, Prof. Dott. Gerhard Küntscher.

Informazione e domande frequenza per il corsi per laureati saranno ricevute sino al 15 luglio 1952 e devono essere indirizzate al Prof. Dott. Albert Lezius, Direttore della Clinica Chirurgica, Università d'Amburgo, Amburgo-Eppendorf, Germania.

Cursos de Post-Graduacao Oferecidos Pelo Capitulo Alemao do Collegio Internacional de Cirurgioes

1. Cirurgia do Thorax. Dado pelo Prof. Albert Lezius, director do Departamento Cirurgico, Universidade de Hamburgo e seus assistentes.

O Capitulo Alemao do Colegio Internacional de Cirurgioes esta organizando um curso de post-graduacao de quatro semanas. Os seguintes assuntos serao apresentados:

a. Metodos modernos de anestesia em

cirurgia torax com demonstracoes praticas
b. Broncoscopia
c. Broncografia
d. Intubacao
e. Cuidados pos-operatorios de arvore bronquial
f. Tratamentos operatorios do carcinoma dos pulmoes
g. Tratamentos operatorios da bronquiectasia
h. Tratamento operatorio da tuberculose pulmonar
i. Tratamento operatorio de tumores do mediastino
j. Cirurgia do esofago e do cardia
k. Tratamento operatorio de doencas cardiacas adquiridas ou congenitas (Tetralagia de Fallot, Buraco de Botal, Coarctacao da Aorta, estenose de valvula aortica, angina pectoris)

2. Cirurgia do Estomago. Dado pelo Prof. Dr. G. E. Konjetzny, Diretor Emerito, Departamento de Cirurgia, Universidade de Hamburgo.
   a. Anatomia patologica e psiologia patologica da ulcera gastrica
   b. Operacoes sobre o estomago
   c. Julgamento do operacao de Dragstedt e simpatectomia
3. Cirurgia Urologica. Dada pelo Prof. Dr. Hans T. Junker, Chefe Clinica Urologica, Allgemeines Krankenhaus Barmbeck, Hamburg-Wandsbek.
   a. Cistoscopia
   b. Pilografia
   d. Diagnostico radiologico das doencas dos rins
   e. Processos operatorios endoscopicos em tumores da bexiga
   f. Tumores da prostata (particularmente hipertrofia)
   g. Prostatectomia
      1. Metodo de Freyer
      2. Metodo de Millin
      3. Metodo de Harris
   h. Cistectomia total em carcinoma da bexiga
   i. Assuntos diversos
4. Fixacao de Fraturas de Osos Longos por Cravejamento Metalico Medular: Dado pelo Prof. Dr. Gerard Kuntscher, Chirurgiao en Chefe, Kreiskrankenhaus, Schleswig.
   a. Consideracoes teoricas sobre cravejamento metalico medular
   b. Indicacoes para cravejamento metalico medular
   c. Osos de perna, braco y ante braco
   d. Cravejamento medular em operacoes para pseudo-artrosis
   e. Tecnica operatoria
   f. Film

A Data: A data provanel para inicio do curso e 15 Julho 1952.

Sitio: Cursos pos-graduados em Cirurgia do Estomago e do Thorax serao dados na Clinica Cirurgica da Universidade de Hamburgo. O curso de Cirurgia Urologica sera dado no Allgemeines Krankenhaus Barmbeck, Hamburgo-Wandsbek.

Taxes: Para os residentes nos Estados Unidos, Central e Sul America e Canada, a taxa sera de $100.00 por curso.

Para os residentes na Europa, a taxa sera de DM 100 para cada curso.

Os Cursos: Os cursos consistirao de demonstracaes practicas, aulas e operacaes dadas por professores e post-graduados.

Diretores: Prof. Dr. Albert Lezius. Prof. Dr. G. E. Konjetzny. Prof. Dr. Hans T. Junker. Prof. Dr. Gerhard Kuntscher.

Informacaes e registro para os cursos de posgraduacao serao recebidas ate 1 de Julho de 1952 e devem ser dirigidas ao Prof. Dr. Albert Lezius, Universidade de Hamburgo, Diretor do Departamento Cirurgico, Hamburgo-Eppendorf, Alemanha.

Date of International Assembly, University of Madrid

May 20-24, 1952

Dates of Preassembly and Postassembly Meetings

University of Bordeaux .....May 13, 14

University of Barcelona .....May 16, 17, 18

University of Vienna .....May 26, 27

Inauguration of Netherlands Chapter, Amsterdam .....May 29, 30

General News Notes

Annual Meeting, American College of Chest Physicians: The Eighteenth Annual Meeting of the American College of Chest Physicians will be held at the Congress Hotel, Chicago, June 5 through 8, 1952. A scientific program covering all recent developments in the treatment of heart and lung disease is being arranged.

The Board of Examiners of the American College of Chest Physicians announces that the next oral and written examinations for Fellowship will be held in Chicago on June 5, 1952. Candidates for Fellowship in the College who wish to take the examinations should contact the Executive Secretary, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

Third Pan-American Convention of Gastroenterology and First National Congress of Gastroenterology: Under the auspices of the Interamerican and Mexican Associations of Gastroenterology, a joint meeting will be held in Mexico City from May 11 to 17, 1952. The president of the executive committee is Dr. Abraham Ayala Gonzalez and the secretary general is Dr. Ramon Flores Lopez. The vice presidents are Doctors Gustavo Baz, Leonides Guadarrama, and Salvador Zubiran. Besides the scientific sessions, there will be scientific exhibits, showings of medical motion pictures, and social events. Detailed information may be obtained by communicating with Dr. Ramon Flores Lopez, Office of Investigation and Instruction of the General Hospital, Dr. Balmis 148, Mexico 9, D. F.

Amputee Conference: The Sixth Annual Amputee Conference will be held at the Kessler Institute for Rehabilitation, Pleasant Valley Way, West Orange, New Jersey, on May 1-3, 1952. Included in the conference will be a children's clinic for congenital amputation, scheduled for Saturday, May 3. The conference will feature lectures by staff members of the Kessler Institute and visiting lecturers, in addition to educational films and demonstrations by patients of amputee training technics. Registration is open to physicians, therapists, nurses and counselors in the rehabilitation professions. Registration requests should be addressed to the Institute. For the first time, certificates will be issued to all registrants who attend the full three-day conference.

New Cancer Wing Opened: A new cancer wing for the State of Wisconsin General Hospital at Madison was officially opened in January, with Dr. Leonard A. Scheele, Surgeon General of the U. S. Public Health Service, as principal speaker. A $975,000 grant from the Public Health Service made the cancer wing possible. Dr. Scheele cited as indications of the concerted fight being waged to stem the cancer evil, the jump from $600,000 to nearly $7,000,000 annually in research funds during the past fifteen years, and 25 new research centers opened, with others in progress.

Brazilian Proctologic Congress: The First Brazilian Proctologic Congress and the Seventh Annual Meeting of the Brazilian Proctologic Society were held from Nov. 14 to 17, 1951, in Rio de Janeiro, Brazil, with specialists from several American countries taking part. The Congress was organized and promoted by Dr. Walter Gentile de Mello, President of the Brazilian Proctologic Society, with the support of all Brazilian proctologists. Dr. Gentile de Mello is Chief of the Proctologic Service, Hospital dos Servidores do Estado, and is editor of *Revista Brasileira de Gastroenterologia.* Twelve official lectures were delivered, covering five special themes on the subject of cancer of the colon and rectum, schistosomiasis, amebiasis, lymphogranulomatous proctitis, and megacolon. Altogether, 65 papers were presented and discussed.

Among the participants from countries other than Brazil were Drs. Venancio Tajes of Uruguay; Carlos Ottolina of Venezuela; A. Garcia Mata and Edgardo Spirandelli of Argentina; Francisco Lichtenberg of Mexico; Joseph D'Anontoni of New Orleans, U.S.A.; J. Castro-Duque of Colombia; Henry C. Schneider, A.I.C.S., of Philadelphia, U.S.A.; Harold Courtney, F.I.C.S., of Syracuse, New York, U.S.A.; and Jerome Wagner, F.I.C.S., and Edward Levy of New York City, U.S.A.

The annals of the Congress will be published in two volumes, with a summary of each lecture and paper in English, under the editorship of Dr. Gentile de Mello and Dr. Manoel Garcia, Avenida Graca Aranha, 81 Rio de Janeiro, Brazil.

Pharmaceutical Laboratories Opened in Manila: With Elpidio Quirino, President of the Philippines, as principal speaker, the new $500,000 pharmaceutical laboratories of Sharp & Dohme (Philippines), Inc., were

officially opened in Manila with special ceremonies attended by prominent civic government and business leaders and local members of the medical and allied professions. The new plant is a one-story reinforced concrete structure containing approximately 20,000 square feet of floor space.

Conference Papers Published: For the second consecutive year, the Society of Medical Arts of Mexico has issued a volume called *Anales de Ars Medici* in which are published the papers and discussions presented at meetings of the Society during the previous year. Twenty-two scientific papers on a wide variety of subjects are included in this second volume. The editor is Dr. Jaime Putianski Constantiner, and the editorial office is at Avenida Yucatan 67, Mexico D. F., Mexico.

Valuable Abstract Service Available: A monthly abstracting service of articles from every available medical journal in the world, comprising 15 sections and covering the whole field of clinical and experimental medicine, is supplied through *Excerpta Medica* which consists of 15 journals published in Amsterdam. Section IX of *Excerpta Medica* is *Surgery;* Section X is *Obstetrics and Gynecology;* Section XI is *Otorhinolaryngology;* Section XII is *Ophthalmology;* and Section XIV is *Radiology.* The members of the Board of Chief Editors are Doctors M. W. Woerdeman, Professor of Anatomy and Embryology in the University of Amsterdam, Chairman; Dr. Morris Fishbein of Chicago; and Dr. W. O. C. Zeeman, Emeritus Professor of Ophthalmology in the University of Amsterdam. The editorial board consists of 58 medical authorities in all parts of the world, including the President-Elect of the International College of Surgeons, Dr. Hans Finsterer of Vienna, and the President of the United States Chapter, Dr. Henry W. Meyerding of Rochester, Minnesota. The abstracts are in English. A typical issue of *Surgery* contains 616 abstracts. The editorial office is at 111, Kalverstraat, Amsterdam C., The Netherlands, and the Editorial Director is Dr. E. K. G. Landsberger.

It is dangerous to disturb the body violently whether it be by starvation or by feeding, by making it hot or cold, or in any way whatsoever. All excesses are inimical to nature. It is safer to proceed a little at a time, especially when changing from one regimen to another.

—*Hippocrates*

The growth of plants forms an excellent parallel to the study of medicine. Our characters resemble the soil, our masters' precepts the seed; education is the sowing of the seed in season and the circumstances of teaching resemble the climatic conditions that control the growth of plants. Industrious toil and the passage of time strengthen the plant and bring it to maturity.

—*Hippocrates*

New Books

Antibiotic Therapy. By Henry Welch and Charles N. Lewis. Washington, D. C.: The Arundel Press, Inc., 1951. Pp. 562.

This comprehensive work is a veritable encyclopedia of knowledge pertaining to all past and present forms of the antibiotics, and is clearly divided into two major sections. It is a work assembled by Welch and Lewis, only after countless hours of arduous searching of the relatively recent accumulation of data on this subject.

Chapter 1 is an orderly discussion of the design of the text and presents the material to be found in the following eight chapters of the first part of the text. Each antibiotic group is subsequently described fully in three phases: its antimicrobial activity, pharmacology, and dosage forms. Chapter 9 is a compilation of five short resumés of miscellaneous antibiotics.

Part II consists of the remaining eleven chapters, and deals specifically, and in considerable detail, with all diseases and infections which are known to respond adequately to antibiotic treatment, their symptoms and any contraindications to antibiotic therapy.

All in all, this work must be considered an extensive reference to all the antibiotics and diseases that respond to this means of therapy. It should be a "must" in the up-to-date library of both student of medicine and progressive practicing physician or surgeon.

The illustrations consist mainly of graphs, which are numerous and easily understandable. In addition there are eight brown and white portrait sketches of persons most commonly and closely associated with the development of the specific antibiotics. The index is complete and concise, and the bibliography is extensive.

M. T.

Tumors of the Skin. By Joseph Jordan Eller and William Douglas Eller. Philadelphia: Lea & Febiger, 1951. 2d ed. Pp. 697, with 550 illustrations and 3 color plates.

This very excellent work should be considered a "must" for the medical library not only of the dermatologist but of the general practitioner and the advanced student. It is a comprehensive source of modern knowledge concerning benign and malignant tumors of the skin.

Because of the detailed manner in which precancerous lesions are studied, it is a valuable source of reference to the physician confronted with the problem of treating the incipient cancer of the skin.

All forms of radiation therapy, including radioactive isotopes, thorium X and radium, have been presented at length in this second edition as well as all the newer methods and technics of surgery and plastic surgery.

This revised reference is indeed a text which the up-to-date physician cannot afford to be without.

M. T.

Functional Anatomy of the Limbs and Back. By W. Henry Hollinshead. A.B., M.S., Ph.D. Philadelphia: W. B. Saunders Company, Publishers, 1951. Pp. 341 with 122 illustrations.

The purpose of this text is to incorporate logically into one volume many facts and opinions dealing with that part of the human anatomy involving muscular function and movement. It was the specific intention of the author to provide the nonmedical student, e. g., the physiotherapist who has little or no textbook or practical knowledge of anatomy, with an easily understandable compilation of accepted theories and opinions concerning muscle function and body movement. Obviously, then, the text does not consist solely of the personal observations of its author, but has been compiled from many sources. Part 1 introduces the reader to terms generally used in the study of anatomy, and also discusses in a fair amount of detail the various tissue formations necessary to proper bodily function. The organic system is likewise generally discussed. Section 2, under the general heading of the *upper limb*, discusses individually its component parts. Section 3 is an overall consideration of the back, and the subject is adequately treated. Section 4 presents a part-by-part discussion of the *lower limb*. The trunk and those anatomic parts which are situated above it are discussed in Section 5.

The work is supplied with a complete subject index. The illustrations used throughout are simple, self-explanatory sketches of the various anatomic parts, many with excellent muscle detail. The physiotherapist, as well as others in like professions, will want to have this text on hand for ready reference.

M. T.

Traitement Chirurgical du Cancer du Rectum (Second edition). By Francois D'Allaines in collaboration with A. LeRoy, N. Du Bouchet, Ch. Dubost, J. Le Brigand and J. Vaysse. Paris: Editions Medicales Flammarion, 1951. Pp. 246, with 74 illustrations.

This reviewer had the pleasure of commenting on this work in its first edition. As the author so justly states, in the past few years, many changes have taken place in operative procedures in the intestinal tract, particularly the rectum. The upsurge of better understanding of the physiology, which resulted in better preoperative preparation of the patient, the outstanding value of the antibiotics, blood transfusions, electrolyte balance, and refinements in anesthesia—all have contributed to better surgical therapy of the rectum. Particularly are the antibiotics of great value, because the habitat of of so many microorganisms is the intestine.

This new edition has added abdominosacral resection of the rectum with prompt anastomosis between the rectum and the colon, that has involved much danger in former years, but the technic and later experiences with the avoidance of the development of fistulas, has added another important procedure to the armamentarium of the surgeon. The authors speak with pride of "at least 50 per cent of five-year cures" of this condition. Abdominal resection is lauded by the authors, and they stress the greater importance and good results that accrue with mature experience.

As in the previous edition, the first chapter deals with the anatomy of the rectum and the anatomic evolution of carcinoma in this locality. This is followed by a discussion of the principles of radical operation for carcinoma of the rectum (Chapter 2). Chapter 3 deals with indications and technic of the various procedures, presents a discussion of radical and conservative operations and concludes with material on palliative procedures. In Chapter 4 operative technic is discussed; this is followed by a discussion of preoperative and postoperative care, anesthesia, examination of the specimen, and postoperative prognosis. Abdominosacral resection is then discussed (Chapter 6) and is divided into the two stages, abdominal and then sacral. Chapter 7 discusses conservative operations and variations of operative technic. Embodied in this chapter are, among other things, the Babcock and Bacon technic, sacral resection, abdominal approach, and resection of the rectum in the female. This is followed by a discussion of radical operations: the abdominoperineal operation, perineal amputation, and mobilization of the perineum. Chapter 9 is a discussion of strictures, disunion of the line of anastomosis, and fistulas and their operative treatment. The concluding chapter (Chapter 10) is an analysis of the results. Here a number of tables are included, demonstrating by statistics the results obtained by other surgeons.

All in all, as has been stated, this is an excellent work and should be in the possession of every progressive surgeon.

M. T.

The Specialties in General Practice. Edited by Russel L. Cecil, in collaboration with William A. Barnes, Douglas D. Bond, Charles G. Child III, R. Cannon Eley, John M. Flumerfelt, Edmund P. Fowler, Jr., Louis M. Hellman, Charles H. Herndon, Chevalier L. Jackson, Hugh J. Jewett, George M. Lewis, R. Townley Paton, Arthur W. Proetz and L. Ramsey Straub. Philadelphia: W. B. Saunders Company, Publishers, 1951. Pp. 753, with 470 illustrations.

This excellent text is an orderly compilation of the literature on the major medical specialties, assembled with the specific purpose of furnishing an accessible reference to the general practitioner, who, being thoroughly familiar with the more common internal disorders, may occasionally find himself out of touch with current development in the specialty fields. Such a practitioner will find this book simply written, in specific and readable language. The material is divided into definite specialty groupings for easy reference and is replete with self-explanatory illustrations, including both photographs and excellent medical drawings. Each eminent contributor was confronted with the gigantic task of reducing his entire specialty, so to speak, into a comparatively small section for use in this reference—including normal anatomy and physiology. In this reviewer's opinion, each has "done himself proud" in handling a very difficult assignment.

An orderly and complete subject index of 63 pages concludes the work. Each ends with a valuable bibliography. The quality of paper and print is excellent.

This text, a veritable one-volume medical library, should be considered indispensable in the library of the up-to-date general practitioner who realizes the importance of keeping abreast of the specialties, since it is the general practitioner, in many cases, who first recognizes the various pathologic entities and refers them to the specialist concerned.

M. T.

Abstracts from Current Literature

A Clinical Study of the Early Post-Gastrectomy Syndrome. Capper, W. M., and Butler, T. J.: Brit. M. J. 2:265, 1951.

Capper and Butler studied the early postgastrectomy syndrome (known also as the "dumping syndrome") in 660 patients subjected to gastrectomy for benign peptic ulcer, gastric or duodenal. They observed that this early syndrome, which usually comes on at the end of the day's heaviest meal or shortly after its completion, occurred in about 12 per cent of the patients. These authors do not review, in their present article, the "late or delayed postgastrectomy syndrome" which starts some two to three hours after meals, occurs in only 5 per cent of patients subjected to gastrectomy and is probably hypoglycemic.

The early postgastrectomy attacks often start before the patient has left the hospital. Immediately after a bulky meal the patient complains of fulness high in the epigastrium, and later this may also radiate downward to the periumbilical region. Loss of weight, nausea, pallor, sweating, a sensation of warmth, etc., are some of the other common symptoms. The authors stress the fact that the *combination* of vasomotor symptoms and abdominal symptoms is necessary to justify the diagnosis of early postgastrectomy syndrome and that abdominal symptoms alone are not characteristic. Lying down affords relief; many patients, on lying down, fall asleep.

Vomiting terminates this syndrome in almost half of the cases. In only a few instances was food vomited, but over half of the patients suffering with the early postgastrectomy syndrome vomited bile-stained fluid, and these were all greatly relieved and often able to resume their meal. These attacks last half an hour or longer, but usually after a couple of years they disappear. In a small proportion of cases the attacks persist throughout life unless remedied by operation.

The authors studied the origin of this condition syndrome and concluded that the causes are *mechanical*. They found that this syndrome does not occur after the Billroth I operation but does occur in 12 per cent of the patients subjected to Polya's partial gastrectomy or to any of its modifications, and this held true whether the ulcer was duodenal or gastric and whether it occurred in an old patient or a young one. They also discovered that much of the trouble is due to the fact that the afferent loop is distended with bile and pancreatic secretions, which cause a kinking of this loop at its upper angle where it is anastomosed to the lesser curvature area of the resected stomach. This kink often disappears if the patient lies down, and the contents of the afferent loop can then be aspirated through a tube. An emptied loop is not apt to cause this syndrome; thus, the weight and distention of the afferent loop is one of the principal causes of this syndrome.

Another cause is the actual weight of the meal itself in the stomach. To prevent this syndrome, the authors recommend adequate support for the stomach during gastrectomy, so that undue traction on the gastric stump can be minimized. They suggest that the upper part of the gastrojejunal juncture be supported by extra sutures to the stomach at level of severance of the left gastric artery, and that the afferent loop of jejunum be attached to the highest part of the lesser omentum, where it is thicker; thus it hangs under the liver instead of pulling too much on the stomach. They also recommend attaching the greater curvature of the stomach to the gastrosplenic ligament, thus preventing gastric rotation as well as affording a little additional support to the stomach remnant.

Since 1948, 128 gastric resections have been performed with additional supports for the gastric stump as described, and in only 1 instance did an early postgastrectomy syndrome develop, though in another case the possibility exists that this early syndrome also occurred.

All the other 126 patients were free of symptoms suggesting this condition. The operation performed was an antecolic antiperistaltic Polya-Hofmeister procedure plus the recommended additional supports for the gastric stump. In the one case in which the presence of this syndrome was unquestionable, there was marked descent of the stomach on postoperative roentgen studies when the patient changed from the supine to the erect position, so it is presumed that the reconstruction recommended for support of the stump was inadequate. Patients suffering for many years from this syndrome can be relieved by reoperation and the proper fixation of the gastric stump and of the gastrojejunal anastomosis as recommended.

RICHARD R. LEONARDO, M.D.

Reticulo-Endotheliosis (Hand-Schüller-Christian Disease). Hodgson, J. R.; Kennedy, R. L., and Camp, J. D.: Radiology 57:642, 1951.

There is considerable confusion, both terminologic and conceptual, as to the pathogenesis of the group of diseases known as Hand-Schüller-Christian disease, Letterer-Siwe disease, and eosinophilic granuloma of bone. The presence of varying amounts of lipoid material, reticuloendothelial cells and granulomatous tissue observed in various stages of these diseases is responsible for the confusion. The histologic picture may vary as the disease progresses, and lipoid material and eosinophilic granulomatous tissue are not always observed in the same section. Foam cells and cholesterol appear in some cases but are inconstant. Thus it is often impossible to classify a given case of any of these three diseases on the basis of histologic structure alone.

Originally the term "Hand-Schüller-Christian disease" designated a syndrome characterized by exophthalmos, diabetes insipidus, and granulomatous lesions of the skull. Later cases have been reported without all these symptoms, but sometimes with such additional symptoms as lymphadenopathy, cutaneous lesions, splenomegaly, hepatomegaly, pulmonary involvement and disorders of the blood. The authors report 10 cases, of a total of 28, in which none of these symptoms were present.

Roentgenologic manifestations in the skeleton consist of areas of destruction, multiple or solitary, in one or more bones, most frequently the skull. Detailed descriptions are given of osseous and pulmonary lesions and of differential roentgenographic diagnosis. The authors conclude that there is little reason to consider Hand-Schüller-Christian disease, eosinophilic granuloma of bone, and Letterer-Siwe disease as separate entities. Early recognition may result in adequate treatment with a high percentage of complete recovery.

E. H. BOYER, M.D.

Spontaneous Obstruction of Gastroenterostomy and Complete Detachment of Intestinal Loop. Hellens von A., and Nummi, P.: Ann. Chir. et Gynaec. Fenniae 40:121-124, 1951.

The first case in which obstruction and intestinal loop detachment followed gastorenterostomy was described by Kehr in 1899. This was only eighteen years after the first gastroenterostomy had been performed by Wölfer. Although isolated cases have been reported from time to time, this remains a rather uncommon occurrence, especially today, since gastroenterostomy has lost much of its popularity as a surgical procedure.

The authors report the case of a farmer aged 43 who was treated for a perforated ulcer in 1937 by suture closure and anterior gastroenterostomy with enteroanastomosis between the loops. At a second operation twelve years later the gastroenterostomy stoma was completely closed and the intestinal loop completely detached from the stomach.

After suture and gastroenterostomy, the stomach probably emptied through both anastomotic loops. After the ulcerative process had subsided gastric emptying again occurred, chiefly through the pylorus. The stomach, dilated by retention of gastric contents, then contracted, and at the same time the gastroenterostomy became proportionately smaller and finally closed. This closure was finally made complete by the development of a marginal ulcer at the anastomotic site. The disconnection of the gastroenterostomy anastomosis is attributed by the authors to (1) the fact that peristaltic contractions in the stomach and in the bowel loop are not synchronous and (2) a possible predisposition to the formation of loose connective tissue.

M. O. CANTOR, M.D.

The Rate of Blood-Flow in the Umbilical Cord. Greenfield, A. D. M.; Shepherd, J. T., and Whelan, R. F.: Lancet 2:422, 1951.

Seldom is it possible to obtain by direct measurement some of the physiologic processes of a human fetus. The authors, all professors in the Department of Physiology, Queen's University, Belfast, present the first successful direct measurement of the rate of blood flow in the umbilical cord of a human fetus. The oppportunity presented itself when a therapeutic abortion was indicated in the case of a 31-year-old woman with active pulmonary tuberculosis. The fetus was removed from the mother by abdominal hysterotomy and placed in an ingenious plethysmograph. Observations were begun one and three-fourths minutes after delivery of the fetus and were completed eight minutes after delivery. The rate of blood flow in the umbilical cord of a normal ninety-three day fetus, weighing 46.9 Gm., was 2.1 milliliters per minute. So far these measurements have been made on only 1 fetus, but there is no reason to think that the observations were marred by technical imperfections or that the fetus was not in good condition.

H. J. ROSEVEAR, M.D.

Azygo-Pulmonary Anastomosis in the Treatment of Mitral Stenosis (L'Anastomose Azygo-Pulmonaire Dans Le Traitement Du Retrecissement Mitral). Dallaines, F., and Dubost, C., J. de Chir. 1951, 67:389, 1951.

It was shown by Lutembacher that in cases of mitral stenosis an interauricular communication is diminishing the subjective and objective disturbances of the disease; there is less pulmonary edema, hemoptosis, auricular fibrillation and similar manifestations.

It was found also that cardiac catheterism even in well-compensated patients with mitral stenosis rather often shows a considerable difference in pressure between the minor and the major circulatory systems. These will be equalized by the existence of an interauricular communication (syndrome of Lutembacher), which establishes an increased tolerance to the disease. To produce such an interauricular communication is a difficult and hazardous operation when the patient is an adult. To obviate this direct communication, an indirect anastomosis was devised which is less dangerous but quite as effective. An anastomosis between the azygos vein and right superior pulmonary vein is done, or one of the major branches is utilized if the main branch is not anatomically satisfactory. The operation is totally extracardial, involving only the vessels of the periphery of the heart, and therefore involves less risk.

The indications for this operation are limited. It is especially recommended in cases of mitral stenosis of the Gassavardin type with prevalence of pulmonary edema and observed in women under 30 years of age. This condition is characterized by crises of acute pulmonary edema during menstruation or after stress. The most important contraindication is pressure increase in the right auricle, with consequent loss or pressure differences between the two circulatory systems, for under these circumstances the operation is not justified. A relative contraindication is age, with such concomitant changes as chronic pulmonary edema, enlargement of the hili and myocardial degeneration—factors increasing the danger of the operation and therefore limiting its use.

The results in 16 cases, with 5 deaths and 2 cases in which operation was impossible because of anatomic abnormalities, are discussed, and illustrations of the technic are presented. Prolonged treatment with anticoagulants, maintained for weeks and even months, is recommended before operation is attempted.

W. K. FRANKEL, M.D.

A More Thorough Operation for Gastric Cancer. McNeer, G.; Sunderland, D. A.; McInnes, G.; Vandenberg, H. J., and Lawrence, W.: Cancer 4, 957, 1951.

The introduction of this paper deals with the poor results of operation for gastric cancer up to the present day. With this in mind, investigations have been carried out on an anatomic basis under five headings: 1. The results of gastric cancer resected in continuity with adjacent organs. 2. Resectability of recurrent gastric cancer. 3. Progress in total gastrectomy. 4. Examination of subtotal gastrectomy as an operation for the cure of gastric cancer. 5. Study of the sites of regional lymph node metastasis (there is a diagram showing the distribution of lymph node metastases in the fifteen cases examined).

A plea is made for radical removal, on the ground that it is not possible to determine at operation whether lymph nodes are malignant. The author's technics for radical total gastrectomy, partial pancreatectomy and splenectomy are described and well illustrated by diagrams. In the opinion of these investigators, the preliminary results of the anatomic studies described justify the magnitude of these surgical technics.

LYON H. APPLEBY, M.D.

Sarcoma and Sarcomatoid Carcinoma of the Thyroid. Saxen, E.: Ann. chir. et gynaec. Fenniae 40:34-49, 1951.

Dr. Saxen, in his work as director of the University Institute of Pathologic Anatomy in Helsinki, Finland, studied 148 cases of malignant goiter diagnosed in Finland from 1942 to 1949. The 148 cases include 5 of sarcoma (3 fibrosarcomas) and 2 of lymphosarcoma. Polymorphocellular sarcomas and hemangioendotheliomas were not observed at all, but 5 atypical carcinomas were seen, in connection with which the former had to be considered in differential diagnosis.

Fibrosarcomas occurring in the thyroid are highly malignant, and they are about equally common in men and women. The theory that they most frequently develop on the basis of nodular goiter is unsupported by clinical evidence. They have a rapid growth and are closely adherent to the adjoining tissue, and even clinically the sus-

picion of malignant change is very strong.

Lymphosarcomas are also highly malignant tumors and lead to death in about one year. They are to some extent radiosensitive and shrink considerably while the therapy is in progress, but this does not noticeably affect the prognosis. The role of nodular goiter in the causation of these tumors is not clear. With regard to differential diagnosis, it would be well to consider, in the first place, small cell carcinoma and struma lymphomatosa, but an accurate study makes it possible to distinguish lymphosarcoma from these two.

On comparison of statistics published in different parts of the world, one is struck by the high variability of mesodermal tumors occurring in the thyroid. For instance, the incidence of these tumors in Swiss statistics is more than 30 per cent, whereas it is only 2 to 8 per cent in American statistics. Hemangioendotheliomas were diagnosed in Bern, the severe endemic goiter area of Switzerland, to the extent of 41 cases for the period 1907-1938, whereas, to our knowledge, only 2 cases have been described in America. In the series collected in this country (Finland), the ratio of mesodermal tumors calculated in all cases of malignant goiter only slightly surpassed 3 per cent, and hemangioendotheliomas were not found at all.

Fibrosarcomas and lymphosarcomas occur only to a small extent in all large series of mesodermal tumors.

According to the author, the present series indicates that anaplastic carcinoma, particularly when it spreads in granulation tissue (e.g., hematoma in the process of organization) may greatly resemble both polymorphocellular sarcoma and hemangioendothelioma. Some caution should therefore be exercised in the diagnosis of polymorphocellular sarcoma and hemangioendothelioma.

H. J. ROSEVEAR, M.D.

Anticoagulants in Acute Frostbite. Theis, F. V.: OConnor, W. R., and Wahl, F. J.: J.A.M.A. 146:992, 1951.

The authors set down the principles for treating acute frostbite, namely, the prevention of shock, the prevention of infection and the prevention of intravascular clotting and gangrene.

Since gangrene subsequent to frostbite appears to be due to the occlusive red cell thrombi, the effective use of anticoagulant therapy is suggested to interrupt the chain of events. Heparin sodium is known to interfere with the adhesiveness of agglutinative thrombi, and this may prevent thrombosis and gangrene in a patient with acute frostbite. Anticoagulants also preserve the resorbability of the interstitial fluid, thereby preventing secondary fibrous tissue formation. This is evidenced by the absence of clot formation in blisters when adequate anticoagulant therapy is maintained.

To be effective, anticoagulants must be given promptly and in adequate amounts. The more prolonged the coagulation time, the greater the effectiveness of this treatment in preventing gangrene.

Fourteen patients with acute frostbite were treated at Cook County Hospital with anticoagulant therapy during the winters of 1949 and 1950. The duration of the hospital stay was appreciably reduced, and the patients returned to normal activity sooner.

Anticoagulant therapy was instituted shortly after admission. Heparin sodium was given every three or four hours for maintenance of an elevated clotting time and until adequate effect from dicoumarol was produced. Other treatment is important and consists of combat of shock with blood and plasma infusions, thawing of the involved areas by exposure to room temperature only, cleansing and application of sterile dry or petrolatum gauze pressure dressings, and employment of antibiotics to combat infection.

Case histories are abstracted by the authors to illustrate the results of treatment of acute frostbite with and without anticoagulant therapy. They showed that adequate anticoagulant therapy in the acute stage of frostbite is of great value in the reduction of the incidence and extent of gangrene and also the period of disability.

CHARLES C. ABBOTT, M.D.

In Memoriam

WALTER DAVIS STEVENSON

M.D., F.A.C.S., F.I.C.S.

Dr. Walter Davis Stevenson of Quincy, Illinois, aged 69, died of a cerebral accident on Oct. 26, 1951.

Dr. Stevenson was a Founder Fellow of the International College of Surgeons. He was a diplomate of the American Board of Ophthalmology and of the American Board of Otolaryngology.

Born in Baltimore, Dr. Stevens received his M.D. degree from the University of Maryland in 1906. He was a member of the surgical staffs of St. Mary's, Blessing, and Chicago Eye and Ear hospitals. He has served as adjunct professor of ophthalmology at the University of Illinois, Eye and Ear Infirmary, Chicago, for the past sixteen years.

Dr. Stevenson served for twelve years as secretary of the Adams County Medical Society, and was also past president of that society; he was also past president of the Eye, Ear, Nose and Throat Section of the Illinois State Medical Society and of the Central Illinois Society of Ophthalmology and Otolaryngology. At one time he served as chairman of the Council of the Illinois State Medical Society. He was a member of the American Medical Association, the American Railway Surgeons, the American Academy of Ophthalmology and Otolaryngology, The American Laryngological Society, the American Society of Laryngology, Rhinology, and Otology, and the American Society for the Advancement of Science. He was a fellow of the American College of Surgeons and of the International College of Surgeons. He made extensive contributions to the literature in his specialty.

MELVIN GEORGE EDWARD WARREN

M.D., M.I.C.S.

The untimely death of Dr. Melvin George Edward Warren of Seattle on Nov. 16, 1951, at the age of 42, has been reported.

Dr. Warren was born in Victoria, British Columbia. He received a B.Sc. degree from the University of Washington in 1931, and the degrees M.D., C.M., from McGill University Medical School in Montreal in 1939. He served an internship of one and one-half years at Seattle General Hospital and a residency in surgery at Pierce County Hospital. During the war he was chief surgeon for Lake Washington Shipyards at Houghton, Washington, in which 10,000 men were employed. He was a member of the surgical staffs of Seattle General, Doctors, and King County hospitals of Seattle, and of Valley Hospital in Ellensburg, from 1945 to the time of his death.

Dr. Warren was a member of the King County Medical Society, the Washington State Medical Society, the American Medical Association and the Seattle Academy of Surgery. He was a Matriculate of the International College of Surgeons and was preparing to take the examination in general surgery, the passing of which would have qualified him for Fellowship.

WILLIAM LEMUEL RHODES

M.D., A.I.C.S.

On July 31, 1951, Dr. William Lemuel Rhodes of Corpus Christi, Texas, died at the age of 67. Dr. Rhodes was an Eye, Ear, Nose and Throat specialist. He received his medical degree from the University of Kansas School of Medicine, served a two-year internship at St. Margaret's Hospital in Kansas City, Kansas, and served residencies in Spohn and Sizer hospitals in Corpus Christi. He took postgraduate work at the Illinois State Eye and Ear Infirmary in 1914, at the University of Vienna in 1928, and at New York Postgraduate Medical School and Hospital in 1939.

Dr. Rhodes was assistant ophthalmologist at the University of Kansas School of Medicine from 1914 to 1917, was dean of the school of nursing of Spohn Hospital from 1932 to 1935, and was a member of the medical staffs of Spohn, Fred Roberts, and Memorial hospitals at the time of his death. He was a member of the Texas State Medical Society, the Southern Medical Association, the Medical Association of the Southwest, the American Medical Association of Vienna, the Nueces County Eye, Ear, Nose and Throat Society. He was also an associate member of the International College of Surgeons.

WALTER WILLIAM COEN

M.D., F.I.C.S.

Dr. Walter William Coen of Chicago died of a heart attack on Nov. 5, 1951, at the age of 59.

Dr. Coen specialized in obstetrics and gynecology. He received his medical degree from Loyola University School of Medicine and served internships in St. Johns Hospital in Springfield and the Chicago Lying-in Hospital and Dispensary. He served a two-year residency in surgery at Postgraduate Hospital and Medical School, Chicago. He was a member of the consulting staff of South Shore Hospital. He was an associate member of the Chicago Gynecological Society and the American Medical Association and a Fellow of the International College of Surgeons.

WILLIAM TILTON RICH

M.D., A.I.C.S.

The death of Dr. William Tilton Rich of Neodesha, Kansas, occurred on Sept. 14, 1951. Dr. Rich was 45 years of age. He received his B.S. and M.D. degrees from St. Louis University, served his internship at Wesley Hospital in Wichita, did postgraduate work at Cook County Postgraduate School of Medicine and at Tulane University Postgraduate School, and was a member of the staff of the Wilson County Hospital in general surgery. During the war he served in the Navy and held the position of chief of surgery at several different bases.

Dr. Rich was a Fellow of the American Medical Association and an associate member of the International College of Surgeons.

VICTOR KIRKPATRICK ALLEN

M.D., F.A.C.S., F.I.C.S.

Dr. Victor K. Allen of Tulsa, Oklahoma, died in a Tulsa hospital on Nov. 9, 1951, at the age of 63. He was born in Hope, Arkansas, and educated in the local high school, at Arkansas College in Batesville, and at Tulane University, where he received his medical degree in 1915. He served his internship at Illinois Central Hospital in New Orleans. He took postgraduate work at Johns Hopkins University in 1922 and at New York Postgraduate Medical School, the University of Tennessee, and St. Mark's Hospital in London in 1928.

Dr. Allen's specialty was proctology. He was a member of the executive board and the board of governors and chief of the Proctology Department of Hillcrest Memorial Hospital in Tulsa, and he served as chief of the hospital staff in 1941. He was a member of the consulting staff of St. John's Hospital in Tulsa, and of Tulsa and Indian Hospital, Claremore, Oklahoma. He was a member of the American Medical Association, the Southern Medical Association (in 1945, chairman of its section in proctology), and the American Proctologic Society. He was also a Fellow of the American College of Surgeons and of the International College of Surgeons. He was a diplomate of the American Board of Surgery in Proctology.

OSCAR BENWOOD HUNTER

M.D., F.A.C.P., F.C.A.P., F.I.C.S.

Dr. Oscar Benwood Hunter Sr., of Washington, D. C., died at the age of 63 on Dec. 19, 1951. Dr. Hunter was professor of bacteriology and pathology at George Washington University School of Medicine from 1916 to 1932 and special lecturer at Georgetown University from 1935 to the time of his death. He was pathologist or consulting pathologist at Doctors Hospital, George Washington University Hospital, Sibley Memorial Hospital, and Montgomery County Hospital, and had been chairman of the medical staff of Doctors Hospital since 1944.

Dr. Hunter received his M.A. and M.D. degrees from George Washington University and served an internship in University Hospital. He did postgraduate work at George Washington University, at Woods Hole, Massachusetts, at Massachusetts General Hospital and at New York Postgraduate Medical School and Hospital. He was a diplomate of the American Board of Pathology; a member of the American Medical Association, the American Public Health Association, and many other medical and related societies; and was a Fellow in Pathology of the International College of Surgeons. He made extensive contributions to medical literature.